The Builder.

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ILLUSTRATIONS.

Competition Design for the Peace Palace at the Hague.....By Messrs. Wills & Anderson.
1. Perspective View.
2. Elevation and Plans.
Church of St. Joseph, Bridgford, Nottingham.....Mr. J. H. Eastwood, A.R.I.B.A., Architect.
Selected Design for Holborn Council Offices.....,,Messrs. Warwick & Hall, Architects.

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The Congress Exhibition.

EVEN if there were no other object gained by the International Congress, it might at all events be recorded that it has furnished an occasion for getting up a remarkable and most instructive exhibition of drawings illustrating the historical development of English architecture; an exhibition which should have been, and we believe was, of great interest to the foreign architects present, for we do not think that our national architecture and its characteristics are by any means so well known to Continental students as those of the principal Continental styles or schools are to us. And even to English architects this exhibition is of value, for it may be long before we see brought together again in one gallery so large and representative a collection of illustrations of English architecture. We only wish that it could remain open for three months instead of only for the present week.

The historical exhibition is divided into four sections: (1) Norman and Early Gothic; (2) Middle and Late Gothic; (3) Early Renaissance; (4) Later Renaissance; and the collection of drawings, which has been in progress for a long time back, was made by a division of labour, one or two architects undertaking to find the illustrations for each section. They have been admirably hung in chronological order, under the direction of Mr. Harrison Townsend and Mr. Forsyth, to whose labours in their arrangement members of the Congress are much indebted.

In regard to the first section, it is a pity that the suggestion which we know was made by a distinguished Honorary Associate of the Institute, to include Saxon architecture and to start the first section with illustrations of the earliest indigenous work which could be classed as architecture, was not acted on. Considering that this was especially an illustration of the development of English architecture, it seems rather a mistake to have constituted the exhibition in such a manner as to give the impression that the old Anglo-Saxon race had no architectural ambitions, and to represent to our foreign visitors that we never had any architecture till we got it from the Continent.

Durham commences the series of Norman and Early Gothic, at least in the catalogue numbering, for the crossing of St. Albans (19), which comes later in order, is earlier and more rudimentary than the Durham work. Iffley Church and the south doorway of Barfreston take their places among these examples of the Early Norman in which the ruling characteristics of what was to develop into Gothic architecture are already recognisable. Some of the illustrations of St. Albans are shown in Mr. Neale's monumental drawings. Next comes Peterborough, the history of which, as in some other cases, is illustrated by a plan coloured to show the different periods. Among these illustrations some are photographs, and one of these (31), a view in the south aisle, brings out curiously the effect of the rude and massive style of the architecture, with its jumble of lines and projections, and one thinks of the steps whereby the stateliness of Roman round-arched architecture had degraded to this almost rough-hewn work, to rise again into a refinement and finish of another type. The Cathedrals of Norwich, Gloucester, and Canterbury, as well as some others, are illustrated by the plans made for the *Builder* Cathedral series, and shaded so as to distinguish the dates of different portions. Mr. Harold Brakspear contributes historical ground plans of Fountains, Beaulieu, and Waverley Abbeys, and Watton Priory, the latter in conjunction with Mr. St. John Hope, and Mr. Hope contributes his very full and valuable historical ground plan of Furness Abbey. In connexion with some of the Abbey illustrations it is interesting to see some of the beautifully-drawn elevations made by or under the direction of the late Edmund Sharpe, who did so much towards the adequate illustration of Gothic architecture in measured drawings. Westminster Abbey closes the first section of the exhibition; among the drawings illustrating it is Mr. Micklethwaite's ground plan showing dates of work, and the large and fine measured drawing of one bay of the Sacrarium, by Mr. E. Emlyn White, lent by the Architectural Association. Among the illustrations of Lincoln Minster is a fine photograph of part of the

triforium of the Angel Choir (121); this should be compared with that in the aisle of Peterborough (31) before referred to; the comparison of the two furnishes a striking illustration of the progress in refinement of line and detail which Gothic architecture had passed through during the intervening period.

The illustrations of the First period are almost entirely drawn from cathedrals and abbey churches; with the Second period we come into a selection which includes smaller churches, and the late mediæval mansion also puts in an appearance in the shape of such examples as Compton Wynyates and Oxburgh Hall, of the gate tower of which there is a very fine and effective photograph (263). One or two of the spire churches shown are of interest in relation to the proportion and design of spires; Snettisham, for instance (142, 143), with its tall slender spire with the very slightly emphasised lucarnes near the top of the spire, and (as one feels at once) exactly in the right place; and Shottesbrooke (250), with its perfectly plain spire, accentuated only at the angles by a roll moulding, shooting up from amid a collection of rather large lucarnes around the base, but with no break in its line above these. Both are examples of character in architecture obtained by a very severe treatment of line and the concentration of decorative features at certain points. In the illustrations of Exeter Cathedral one may observe the fine and satisfactory effect of the simple symmetrical lines of the nave vaulting (190), showing the last phase before the vaulting began to assume the plan which culminated in that of the fan vault. In the illustrations of Bristol Cathedral one notices the curious freak in vaulting, in the free ribs in the roof of the Berkeley Chapel vestibule (208), which nevertheless is a useful comment on the vaulting system of mediæval architecture, furnishing ocular evidence of the fact that the ribs are an independent structure. Heckington Sedilia (244, 245) carry us back to the days of our "Bowman and Crowther," in which Heckington and Ewerby churches were the *pièces de résistance;* and Mr. J. J. Cresswell's drawings are a little in the old style of draughtsmanship, too. Illustrations of Winchester, York, Lichfield, Beverley, Worcester, and many others of the great cathedrals and churches containing late work, find place in this section; some of the Norfolk and Suffolk churches, too, are represented; among the illustrations of these is a coloured measured drawing by Mr. Joass of the well-known remarkable roof of Knapton church. There is a fine view of the interior of King's College Chapel, and among the late work is the large and elaborate drawing by Mr. H. O. Cresswell of the screen of Henry VII.'s tomb, which, like a good many other drawings in the collection, has appeared in our illustration pages.

With the Early Renaissance Section we begin to get more decidedly into the region of secular and domestic work. One of the first things that meets us is the exceedingly fine elevation drawing (325), by Vertue, of the gate to Whitehall, once at the top of Old King-street, which many of our readers will remember as the narrow back street parallel with Old Parliament-street, from which it was separated by a block of houses now removed to make way for the widening of Parliament-street. This drawing, lent by Mr. Walter Spiers, is one of the most interesting things in the Third Section of the exhibition, both in drawing and design. Illustrations of Cowdray House and Kirby Hall (331, 355 *et seq.*) illustrate finely the broad and bold treatment of large windows and pilaster orders found in various houses of Early Renaissance date; the less known example of Cowdray is so like Kirby in its general treatment and features as to suggest more than an accidental resemblance. Wollaton Hall, which has its own individuality of treatment, also comes into this section. With these more stately examples of early Renaissance one may contrast Moreton Old Hall, in date Renaissance, in character much more mediæval; and Moyns Park, Essex (424), an example of what one may call the bay-window style, the front showing three large semi-octagon bays, spaced at equal distances, the whole height of the front. Another example which has its own peculiar stamp is Lanhydroc (464), one of the many instances of an architectural taste in Cornwall peculiar to the county. In looking at this early Renaissance portion of the collection one cannot but be struck with the variety of treatment and uncertainty to be found among them; in the two previous sections we are continually in the presence of a development of architecture in one direction and in accordance with an underlying principle; in the Early Renaissance section development has been arrested, or if there is development in a sense, it is in an irregular and accidental manner, and the examples impress one largely as experiments.

And yet there is more of an instinct life in this than in the Fourth Section, in which English architecture has settled down on a definite style, but it is for the first time a course which is to a great extent imitative and second-hand architecture. One value of this historical collection is that it brings out so forcibly the distinction between original and artificial or imitative development. The Early Renaissance can hardly be called imitative, for though it adopts or adapts features from classic architecture, it uses them in a manner for which there is no classic precedent. With the Fourth Section we are in the Inigo Jones and Wren era, and thence to 1850. The Institute has lent from the Burlington collection an interesting set of original drawings by Inigo Jones, not, as may be supposed, remarkable for their execution (except for what Jones and his contemporaries would have called a certain "brio" about them), but full of strange suggestions redolent of the taste for masque architecture in which the great architect was led to fritter away a genius meant for greater and more permanent things. The Institute lends also its two fine drawings, of comparatively modern date, of Wren's first design for St. Paul's; also Wren's original sketch for the Greenwich dome, with a skeleton plan over it. Kent's "Design for a Palace at Whitehall" (524-7) is a correct and not ineffective design in his rather timid manner. Various London steeples by Wren come into the show; and Houghton Hall and Seaton Delaval; and so we go on to Burton's Constitution Hill arch with the quadriga on it as intended (a reminder that it ought to be placed there now), and St. George's Hall, Liverpool; among the illustrations of which is a poor little perspective sketch in water-colour by Elmes himself (that was before the days when the professional perspective "hand" assumed so large a sway). Cockerell's Liverpool Branch Bank of England, one of the most refined pieces of modern classic ever produced (669) is illustrated, and the architectural procession closes with the Houses of Parliament, illustrated by drawings and by models of the two towers and the central lantern (711).

Contemporary work is illustrated by a very numerous collection of framed photographs in the large room in the basement. Each architect made his own selection within a certain limit of size and number laid down; and the collection may be considered to be a fairly representative one. It was quite right to include the illustration of contemporary English work; there had, we believe, been some doubt at first as to the advisability of doing so, but we certainly think it would have been a mistake to have had a historical collection stopping at 1850, and then to have left the present day a blank, as if there had been no English architecture since then. But one contrast does strike one, in comparing the modern work with the ancient—a contrast that is not the fault of the modern architects; it is, the small amount of great and monumental buildings that are found among the modern work. We began with cathedrals and hardly anything else; as the history goes on the tasks of architecture seem to become less and less dignified and monumental and the part taken in them by pure architecture to become less and less, till we are landed at last in a collection mostly of comparatively small buildings for practical purposes, and in which architecture in the higher sense has become a secondary consideration, and can hardly obtain a footing. Architecture in modern days has become more practical; but where has her poetry fled?

The Octagon Gallery and the large gallery are hung with water-colours of architectural subjects; a proposal had been entertained to hang the large gallery with oil-paintings of this class, but it was abandoned on account of the difficulty which would probably be experienced in getting together a sufficiently large collection. The first numbered drawing in the Octagon is rather an architectural drawing than a picture; an elevation of Claydon House, Bucks, by Robert Adam; little more than a flat wall with rectangular openings cut in it. Probably there was (or is) a great deal of charming decorative work in the interior, but externally it is certainly a low standard of house architecture. Among the drawings in the Octagon is a fine example of the old Girtinesque school of water-colour, the drawing of the old Tower, West Gate, Gloucester (726), by Joseph Braddon. In the same room is Tite's painting showing various buildings

and designs by Inigo Jones combined into one picture, as Cockerell subsequently combined those of Wren in a similar manner. In the large room is a very fine series of water-colours, including a collection of drawings by Mr. R. Phenè Spiers, and a collection of the work of the late George Devey; three charming drawings of old bridges by Mr. Ernest George; interiors of St. Paul's and of two of Wren's churches by Mr. Fullevlove; interiors of Westminster and Ely by Turner, and a fine one of the east cloister of Westminster by Mr. T. M. Rooke. The collection is not exactly representative, for water-colour drawings of architectural subjects are (in this country) a vast field, but it is a very good and interesting one.

The furniture and silver sections of the exhibition should be of great interest to architects, both British and foreign. With regard to the former, one may say that so many exceptionally fine pieces have rarely been gathered together into so small a space. Ranged round the lower gallery in rough chronological sequence are to be found representative pieces of most of the styles prevalent in this country from the beginning of the XVIth to the beginning of the XIXth centuries. Space has not allowed the inclusion of any large pieces, but as a whole the collection which Mr. E. Guy Dawber has brought together is a surprisingly good one, and should certainly afford our foreign visitors an insight into British furniture at its best. Mr. Seymour Lucas, M.A., lends some fine pieces of Gothic, a lady's chair in oak being of particular interest. Mr. Percy Macquoid's Queen Anne lacquered cabinet is a superb piece, though one must suppose that the whole work was probably not executed in England. Of the same date are three or four chairs, followed by certain specimens of Chippendale work. Most notable of these latter is a long-case clock, only surpassed by another in the Sheraton style which stands opposite. Both are the property of Mr. Alfred Davis, who also lends two Hepplewhite chairs, an Adam arm chair, a delightful Pembroke table, and other XVIIIth century pieces. Mr. Burghard's two globes, belonging to the Adam period, are two of the most beautiful pieces of the kind ever exhibited. Mr. Cutler lends several pieces of satinwood, including a rather curious garden-seat; and last, but by no means of least interest, are five old musical instruments, including a spinet made by Thomas Hitchcock about 1710, lent by John Broadwood & Sons.

Mr. Starkie Gardner has been satisfied to show few examples of silver work, but each piece is of much individual interest. The two steeple cups respectively lent by Mr. Leopold de Rothschild and Mr. Pierpont Morgan, are each unique; and two or three smaller pieces lent by the same gentlemen must appeal to all those who are interested in work of the kind. Sir Samuel Montagu's work by Paul Lamerie (*c.* 1620-1751) fills a whole case, and shows the artist at his best. Other lenders are Mrs. Percy Macquoid and Mr. B. S. Straus, M.P., whose tea-caddy, dated 1728, and coffee-pot, dated 1749, are perhaps the most interesting of the smaller pieces.

NOTES.

The Condition of Westminster Abbey.

IN consequence of reports by the architects to the Dean and Chapter, and to the Ecclesiastical Commissioners, an extensive scheme of restoration, or more correctly of repair, has been decided upon by the authorities of Westminster Abbey. The average annual expenditure on account of maintenance will be increased by about 4,000*l.* or 5,000*l.* a year during the next four or five years, with the object of refacing the greater part of the north front, where the stones are much decayed as the result of age and the deleterious effects of the London atmosphere. The suggestion has been made in the daily press that the vibration due to heavy motor vehicles is accelerating the destructive work of nature, and in support of this theory it is said that a large piece of stone, which broke off a few days ago owing to a flaw, was probably shaken down by motor traffic. Evidence of this shadowy kind really does not seem to be worth printing, and we think it would be difficult to find any newspaper readers willing to believe that substantial masonry structures are ready to fall to pieces on such small provocation as may be occasioned by the slight tremor arising from adjacent road traffic. Heavy motor vehicles, and especially omnibuses, have a good deal to answer for just now, and that is all the more reason why the attempt should not be made to saddle them with sins they have not committed.

The Salisbury Disaster.

THE most satisfactory fact established at the coroner's inquest on the Salisbury railway accident is that this regrettable occurrence was not the result of defects in the rolling-stock or the permanent way, but was caused simply by the excessive speed of the train round the fatal curve. Mr. Jacomb Hood, Chief Engineer to the London & South-Western Railway Company—described by one of our daily contemporaries as "Jacob Hood, Chief Resident Engineer"—stated that the curve was quite safe for a speed of 30 miles an hour, which is the maximum permitted by the company's regulations. Other witnesses estimated the actual speed to have been from 50 to 70 miles an hour. The only reason for this excessive rate was the disregard displayed by the engine-driver to the regulations issued by the company and posted up in all the running shops on the line.

The Collapse of a Warehouse in Liverpool.

CAST-IRON columns are undoubtedly convenient, but being always liable to hidden flaws and places of unsuspected weakness, they present risks from which built-up steel columns are exempt. An unusually heavy load, or the extension of a flaw, may at any time bring about failure without the least warning, as happened in Liverpool last month, when a large warehouse belonging to the Corporation suddenly collapsed owing to the failure of a main column in the basement. The Coroner's jury, in returning a verdict of "accidental death," on Thursday last week, expressed the opinion that there should be stricter and more continuous inspection of warehouses, no matter whether they belonged to the Corporation or not. That is all very well, but the most rigid examination will not reveal the presence of interior flaws, and the moral is that cast-iron ought not to be used now that we have at hand a far better material, and one that always gives timely warning of impending failure.

The Labour Market.

THE Labour returns for June show, on a whole, slight improvement in the principal trades, the Trade Union returns showing about 3·7 per cent. of their numbers unemployed, as compared with 5·2 per cent. at the same time last year. All the same, the figures relating to trade disputes show an increase, since 36,170 workpeople were affected by disputes in June, 1906, as compared with 11,855 in June of the preceding year, showing a loss of 338,700 working days, as compared with 182,700 in the corresponding period last year. These figures will be watched with interest, as we have always maintained that the diminution in disputes was largely due to the responsibility attached to the funds of the unions by the Taff Vale decision, and we anticipate the proposed legislation will directly affect the number of strikes and disputes.

The Trades Disputes Bill.

IT appears that the Attorney-General has given notice that amendments will be moved during the Committee stage of the Trades Disputes Bill which will make clause 4 read, "An action against a trade union or against any members thereof on behalf of themselves and all other members of the trade union, for the recovery of damages in respect of any tortious act alleged to have been committed by or on behalf of the trade union, shall not be entertained by any Court." In plain language this means that the Government, despite the protest made by the Attorney-General against dangerous class legislation, have decided to climb down and accept the principle of non-liability on the part of trade unions for the illegal acts of their accredited representatives, which was aimed at in the Bill favoured by the Labour members. We recommend our readers to reperuse the eloquent terms employed by the Attorney-General in urging the House, in his introductory speech on the Government Bill, not to adopt the course which the Government are prepared now to recommend. That speech is the strongest possible comment that could be made on the clause now drafted by the Government.

Employer and Workman.

A CURIOUS contention was raised in the recent case, Devonald *v.* Prosser & Sons. The defendants had regularly employed the plaintiff for many years as a rollerman at their tin works. The employment was regulated by certain rules, one of which provided that "no person regularly employed shall quit or be discharged without giving or receiving twenty-eight days' notice in writing." The plaintiff was paid by piecework according to the amount performed. Owing to slackness of trade the defendants shut down their works on July 20, but gave the

plaintiff notice the following August 3. The defendants contended that the contract did not compel them to find work for the plaintiff when it would necessitate the business being carried on at a loss, and that this was a risk taken on himself by the plaintiff. It is hardly necessary to say that this contention did not find favour either in the Court below or in the Court of Appeal, and the plaintiff recovered damages for this breach of contract.

Landlord and Tenant.

THE case of Lewes *v.* Baker, commented upon in these columns June 3, 1905, has been carried to the Court of Appeal. A certain publichouse was let "from May 13 last until such tenancy shall be determined as hereinafter mentioned at the yearly rent of 70*l*"—payable at quarterly intervals "in every year." The agreement provided that either party could determine this tenancy by giving the other party three calendar months' notice in writing. The question two Courts have had to decide is whether the premises were let on a yearly tenancy, in which case the notice could only be given three months before the end of the year, or whether it constituted a three-monthly tenancy. Having regard to other terms contained in the agreement, such, for instance, as that the tenant should repair, should pay the taxes, and be subject to ejectment in case of misconduct, the Courts construed this as a yearly agreement, but a study of the decided cases on this subject shows how fine the line has to be drawn, and we again urge lessors and lessees to avoid such litigation by a little care in expressing their intentions at the time when they enter into such agreements.

Motor Traffic.

THE Kensington Borough Council have addressed representations to the Commissioner of Police drawing attention to the annoyance caused to the inhabitants of the borough and the serious depreciation in property caused by motor omnibuses and heavy motor traffic. In this representation it is stated that owing to this nuisance house property is being vacated with deplorable results from a trading and rating point of view. If the inhabitants of the borough are vacating their houses hoping to find a relief from this nuisance in the suburbs or in the country they will soon discover they have but changed Scylla for Charybdis. The heavy traffic is increasing in country districts, and the increased speed of the lighter motor vehicles in more open areas more than counterbalances the danger and annoyance caused by the omnibuses. Houses near highways are unletable and unsaleable, and crops are ruined by dust. The plain fact will have to be recognised that our highways are not constructed for heavy luggage trains or expresses. The former grind the surface into powder, and the latter raise this in the form of dust. A motor-car travelling twelve miles an hour does not raise a serious amount of dust, but above that speed it is an intolerable nuisance. How long are householders to maintain roads for the destruction of their own property? That is a question owners of property are beginning to ask themselves; yet the efforts to abate the nuisance cause increased expense in maintaining roads and experimenting with costly material, an expenditure which is not borne by the motorists who cause the nuisance, but by the landowners, householders, and fruit-growers who chiefly suffer from it.

The London County Council and Electric Wiring.

THE London County Council Wiring Clauses, which were passed by a Committee of the House of Lords last week, confer full powers on the sixteen boroughs who supply the County of London with electric energy to wire their consumers premises. This decision will probably affect, temporarily at least, the business of several wiring contractors. The London County Council is also authorised to lend the boroughs money to enable them to undertake the business of electric wiring on the hire-purchase system. The hardship inflicted on private enterprise by this decision is very slight. According to English law a contractor cannot remove his wiring if the tenant leaves, or if he does not continue to pay his instalments. The wonder is, therefore, that there are any contractors who are willing to run such obvious risks. It is only equitable that the London boroughs should have powers already possessed by some fifty local authorities. They are not allowed to manufacture fittings or apparatus, but they can supply on hire and set up any kind of electrical appliance. This will be greatly to the advantage of the small consumer. The usual basis for a charge for installing the electric light is a fixed price per lamp, and hence it is to the advantage of contractors to fix more lamps than are required. It was given on evidence that for plain fittings the usual price varied between 12s. 6d. and 17s. 6d. per lamp. So much, however, depends on local circumstances that we should have put the limits much farther apart. In our opinion the use of small electric motors for industrial and domestic purposes should be encouraged as much as possible. The Westminster Electric Supply Corporation stated that they had started a system of lending out motors and electrical apparatus, but had given it up, as the appliances rapidly became "antiquated." We do not attach much importance to this failure, as there may have been other causes at work besides the "antiquation factor." On the other hand, the hiring system has proved most successful in Bradford, where the power of the motors connected with the mains in everyday work already exceeds 6,000 horse-power. We would point out to small consumers that corporations and supply companies can buy motors on the best terms, and that the advice they give as to the best motor to use is disinterested.

Drains and Sewers.

IN the annual Report from the Chairman of the Highways, Sewers, and Public Works Committee of the Borough of St. Pancras some statistics are given showing that a large proportion of the work carried out by the Borough during the past year ending March 31 has been necessitated by combined drains which have been converted into sewers, and the Report contains some observations on the state of the law governing this question. These remarks are on the whole well called for, since, as we have so often pointed out in these pages, the law is in a most unsatisfactory state. We however venture to think the Report misstates the law in one respect. The statement that a drain can be converted into a sewer even by a surreptitious connexion with the drainage of some other house is correct, but the Report goes on to say that "thus contrary to a principle of English law a man is allowed to profit by his own wrong-doing." From a judgment of Mr. Justice Channell's, set out at p. 46 of Mr. Macmorran's book on "Sewers and Drains," it will be seen that learned judge says he knows of no such case where an existing owner has been so allowed to benefit by his own wrong-doing; and a study of the cases will show that the surreptitious junction has always been effected by some former owner. What is required is certainty in the law and an abolition of its many complications and anomalies in connexion with matters of everyday life. But when this branch of the law is made the subject of fresh legislation it has also to be borne in mind that the principal function of local authorities and the main object of the rates is that a good system of drainage should be maintained by the authorities out of the rates. The municipalities sometimes overlook this fact, and whilst levying rates are too anxious to throw the burden of repairing and maintaining drains on private owners, who thus pay out of two pockets at the same time. After all, privately maintained drains should be the exception and not the rule.

The Future of the Ouse.

IN a lecture delivered by Mr. Alfred Creer, City Engineer of York, before the Yorkshire Philosophical Institution, some interesting particulars were given relative to the past and present condition of the Ouse between Goole and York. The great drawback of the river is the large amount of suspended matter in the water, and which is deposited to such an extent as to form a serious obstacle to navigation, especially in the summer months. This has been the great difficulty of the last five hundred years, and in face of the continued accumulation of silt during long periods of drought, and in times of only ordinary rainfall, dredging would be futile. The evil is undoubtedly aggravated by the abstraction of water for the reservoirs of the Leeds and Bradford Corporations. Of course, these reservoirs are filled normally in the winter, but water is also taken in summer, and so the river does not get the occasional floods that would be so useful in July and August for scouring the Channel. Mr. Creer considers the project most likely to bring about a permanent benefit to the Ouse navigation, so far as York is concerned, would be the construction of a lock and weir below Kelfield, but at present he has no definite proposal to make as to the form of weir for adoption. As the value of the traffic now brought up from the Humber is no less than three million tons, the subject clearly justifies action on the part of the authorities.

Merthyr Tydfil Urban District.

DR. J. SPENCER LOW'S Report to the Local Government Board on the sanitary circumstances and administration of this district throws some special light on possible causes of insanitary conditions and consequent disease. For instance, while it is stated that the filthy condition of many of the houses is difficult to realise unless actually seen, it would seem that, however proper from a structural point of view may be the houses in which people of the class in question live, the occupants tend in a very short time by their habits and mode of life to degrade their habitations. Most of the dirtiest places Dr. Low saw in Merthyr and Dowlais were courts and back streets rarely traversed by the more respectable inhabitants of the district, public opinion being accordingly a matter which the inhabitants of such areas are not called on to consider; and he notes that after visiting a number of dirty houses he now and again came suddenly upon houses, not materially different in structure from the others, which were very well kept; while also it became often obvious that the centre of the street divided a sanitary from an insanitary area. The cause of these contrasts would seem to be a difference in ownership; some houses in Merthyr being kept clean because the landlord insists upon it, and some allowed to be dirty because the landlord does not take trouble in the matter. One of the worst features in the district seems to be the habit of disposing of the contents of ashpits and privies by tipping them on to refuse deposits in the district, of which seven existed at the time of Dr. Low's visit, in some cases very near to dwellings. A more insanitary practice can hardly be imagined. As Dr. Low rightly insists, all such refuse should be burned.

Shorland and Minster, Isle of Sheppey.

SOME property extending over 2,520 acres in the parishes of Minster, Eastchurch, and Leysdown, which is placed in the market, includes the Shurland, or Shorland, estate, with an interesting old house upon the site of the ancient castle. The place is mentioned by Samuel Scott, the painter, in his account of the tour which he, Hogarth, John Thornhill (Hogarth's brother-in-law), Tothall, and Forrest made in North Kent in 1732. Hogarth made a drawing for Nicholls of the tomb in Minster Church, of Sir Robert de Shorland, with recumbent effigy and the head of his horse as swimming in the sea, whom Edward I. knighted at Carlaverock. In the church—locally known as Horse Church—is the monument of Sir Thomas Cheney, K.G., Warden of the Cinque Ports, on whom Henry VIII. bestowed Minster Abbey. Cheney rebuilt the manor-house, Shurlands, in Eastchurch, with materials brought, it is said, from Chilham Castle. Scott drew the reputed effigy of Cerenemo, the Spanish general captured by Drake, who died at the Nore and was buried there in 1591. The fine early XIVth century brass—conjectured to be of French workmanship—of Sir John de Northwode and his wife, Joan de Badlesmere, is cited by Boutell in his "Monumental Brasses and Slabs," 1848, and forms a notable study of military costume; the mailed figure of Sir John has been restored, but so as to show him cross-legged: a departure from the original design. Ewan Christian restored the church in 1880-1; it consists of St. Katharine's aisle, built on the south side by William de Corbeuil, Archbishop of Canterbury (1123-1136), for some Benedictines whom he reinstated there, and of the church of the nunnery, founded in or about 668 by Sexberga, daughter of Anna, King of the East Angles, and widow of Ercombert, King of Kent, which during nearly two hundred years was the school of the princesses of that kingdom.

London County Council School of Arts and Crafts.

THE Annual Exhibition of Works executed by students of the London County Council Central School of Arts and Crafts in Regent-street was open to the public last week. The exhibition is always an interesting one, and the present is no exception; as usual, the work comprises a great variety of subjects—design in various forms, book-binding, silversmiths' work and jewellery, engraving, stained glass, cabinet work, carving and gilding, lace embroidery, miniatures, lithography, modelling, etc. In an exhibition of so wide a scope it is difficult to say in which section the best work is being done, though some of the crafts naturally attract the clever and more ambitious student. The miniature section is the most disappointing; that of architectural design has but a very small following, though there is interesting work shown and good architectural sketching as well. The lithography is very interesting and of a high order of merit. There is good stained glass, and the gesso-work and carving are attractive for the suitability of treatment of design to the materials. Over 900 students have been enrolled during the session, being a great advance upon previous records. The new school in Kingsway is in course of construction. One of the features projected for next session is a day technical school for boys, preparatory to entering the silversmithing and kindred trades.

The Leicester Gallery.

AT the Leicester Gallery is a collection of water-colours and drawings of the English School, among which are two very fine works by Collier (21 and 33). Copley Fielding's "Storm at Sea" (14) is amusing as recalling the ancient system of sea painting—thunderclouds in the rear and foreground sails bright against them, which Copley Fielding in particular employed so constantly that one hardly connects his name with anything else. There are some beautiful little works by Mr. Goodwin and Mr. Sutton Palmer, and a good example of James Holland (42), in which one sees Venetian buildings treated brightly and clearly instead of being reduced to smudges as by the modern practice. In an adjoining room is a collection of the works of two French painters. One of them, the late M. Boudin, attained a reputation which is borne out by this exhibition, especially in the two paintings, larger and smaller editions of the same subject, "Entrée du Port du Havre" (9 and 15); but his power in the skies is over-rated in the "puff preliminary," affixed to the catalogue, which also very much over-rates the work of the other painter represented, M. Lebourg, a shadowy and somewhat blottesque landscape-painter with a sense of colour, best shown in No. 22, "Soleil Couchant au Printemps." We presume some purchasers are supposed to be influenced by these laudatory prefaces prefixed to catalogues, or they would not be inserted; but they are almost always exaggerations.

Sketches by M. Rey.

M. AUGUSTIN REY, who obtained the first premium in the Fou[illegible]dation Rothschild competition for th[illegible]t designs for new artisans' dwellin[illegible] Paris, and who is now in Londo[illegible] a member of the Architectural Congress, shows by the exhibition of his collection of bold and powerful water-colour sketches at the New Dudley Gallery (169, Piccadilly), that he is an architect of very all-round ability. To produce the best plans in a competition for artisans' dwellings, and to fill a gallery with picturesque sketches of mountain scenery, is evidence of an unusual versatility of talent; and we recommend M. Rey's architectural colleagues at the Congress to look at his water-colours.

EGYPTIAN EXHIBITION AT UNIVERSITY COLLEGE.

AMONG the many interesting exhibits of the British School of Archæology in Egypt now on view at University College are models of the town and temple of Onias and the Hyksos Camp. These sites lie on the eastern side of the delta between Cairo and Ismailia, and are contiguous. Although they are of widely different character, their historical relationship is very close. Professor Petrie has not only proved this, but has also proved, in the most convincing manner, their relationship to the upper and lower cities of Jerusalem.

The Hyksos or Shepherd Kings were a rude, uncultured, nomadic people of Semitic origin, with no knowledge of building. Their history and the nature of their unaccountable conquest have, up to the discovery of their camp, been veiled in obscurity, and the light now thrown upon these by Professor Petrie's last season's work is perhaps the only knowledge we have of this strange people. We are enlightened regarding their history by the chronological classification of more than two dozen kings of the Hyksos age during a period ranging from the XVth to the XVIth dynasties. The nature of their conquest has been proved to have been the superior fighting value of well-organised archery over hand-to-hand fighting, which latter was the method of the Egyptians. We have only to look at less ancient history to find proof of this. The remarkable value of scientific excavation and careful analogy in deducing such facts is illustrated in Professor Petrie's work here. The camp measures about 1,500 ft. square, and is surrounded by a huge bank about 200 ft. thick at the base. The outside face of this bank is sloped back to an angle of 40°, and is covered with a thick coat of stucco. No stone or timber work is used; consequently there is no gateway. The entrance is by one sloping roadway 200 ft. long, rising to the top of the bank, the bank at either side of this point being strengthened in a manner which allowed of more effective flank defence. This defence was by archery, and its efficiency can be judged when it is understood that the steep stucco slopes surrounding the camp rendered assault by sudden rushes impossible, while the long steep road to the entrance, filled with fine sand and exposed to the arrows of the defenders on the flanking heights, made assault from that quarter equally difficult.

Soon after its construction the camp was

surrounded by strong walls of Egyptian character, evidently built by forced Egyptian labour. They are monumental evidence of the thorough nature of the Hyksos conquest.

The artificial mound which lies to the north-east of the camp was not formed until 150 B.C., when the Jews, led by Onias the High Priest, fled from the persecutions of Antiochus Epiphanes, and settled in Egypt. This mound is still known as Tell el Yehudiyeh (the mound of the Jews), and occupies an area of about six acres, rising to a height of over 70 ft., and crowned by buildings. Its form is in general a replica of the Temple Hill of Jerusalem on a smaller scale, and on it was built a temple after the model of the Temple of Zerubabel, which was built after the captivity. The dimensions are smaller, and in this respect correspond to the rather vague description of Josephus. The main topographical features have been maintained, and the curving Tyropœon Valley, which separates the Temple Hill and Western Hill of Jerusalem, is echoed in the flat which separates the artificial mounds of the Temple Hill of Onias and the camp of the Hypsos. The form of the Temple Hill has been observed, and the walls follow a contour closely resembling the original. Fragments of masonry discovered are of a type of bossed and margined stones which is common to Palestine, and which prevailed at that period. The reconstruction of the walls of Jerusalem by Nehemiah is of this character, and no such type is to be found elsewhere in Egypt. Architectural fragments show a debased Greek style, called by Professor Petrie "Græco-Egyptian." An exactly similar character can be seen in the remains of the Asmonean period in and around Jerusalem. It is unlikely that the Zerubabel temple, which was built about four centuries earlier, showed this characteristic.

There are many points of Jerusalem topography raised by this discovery, and we await with interest their future developments. The discovery is a striking example of the extraordinary tenacity of the Jews to the memory of their holy place and the sacred hill on which it stood, even to the point of building its fellow with their own hands and erecting thereon a temple which was a model of that from which they had been driven.

ANCIENT EARTHWORKS AND FORTIFIED ENCLOSURES.

WE have received the Report of the Committee on Ancient Earthworks and Fortified Enclosures, which was presented to the Congress of Archæological Societies on the 4th inst. The Committee, at the commencement of the Report, express their disappointment that the archæological societies of the country have not yet been able to undertake the systematic scheduling of the ancient earthworks and defensive enclosures in their respective districts, and they urge the importance of the publication of such lists in *Transactions*, and as separate pamphlets, which can be distributed, not only to the owners and occupiers of the sites, but also amongst the county, borough, rural, urban, and district councils, whose members may be able to use influence to prevent the destruction or mutilation of the remains of many early fortresses, camps, and strongholds throughout the land.

In regard to the destruction of such works, so valuable in a historical sense which is still going on, the Report publishes the following tabular statement, which we reprint in full :—

"The destruction or mutilation of defensive earthworks, and even more of tumuli and barrows, is constantly proceeding in many parts of the country, but passes unnoticed or at least unrecorded in most instances.

Cases which have come under notice include :—

Charlton, Kent.—The hill upon which is the last remnant of the once important camp was long since quarried on the north-east, and now the south-western side is in process of rapid removal.

Grindon Hill, near Sunderland.—The destruction of a double barrow on the summit of the hill is recorded in the *Proceedings* of the Society of Antiquaries of Newcastle-on-Tyne. (Ser. 3, Vol. II., 1905.)

Woodbury, Stoke Fleming.—This fine prehistoric Devonshire work is being demolished for agricultural purposes.

Ham Hill, near Montacute, *Somerset.*—This large and important earthwork is threatened with mutilation by the extension of quarrying operations.

Quarry Wood, Loose, Kent.—The rampart of the "camp" is being further destroyed at its northern end by the extension of the quarry.

Painswick Hill Camp, Glos.—Mr. St. Clair Baddeley writes :—"The ancient entrance (S.E.) is being vigorously attacked for ragstone. The quarrymen are taking the terminations of the two successive lower ramparts, and the fosse between these, and eating it up! This camp is triangular in form, stands 927 ft. above sea level, contains about 2½ acres, and is still surrounded on two sides (W. and S.) by its double fosse. The N. side has severely suffered from quarrying in other days, and merely preserves its shape in the foundations of the quarried out ramparts." There is reason to hope that further destruction will not be permitted.

Lewes Castle.—Learning that a proposal had been made to erect a building for the accommodation of the Sussex Archæological Society's Library in the fosse of Lewes Castle, the Committee made an urgent appeal to that Society to spare the site, pointing out that it "is the only remaining open portion of the encircling fosse from which was thrown up the great mount of the Castle," and that any building would "inevitably destroy the characteristic features of this last remnant of a most important part of the original defences."

The Sussex Archæological Society is to be heartily congratulated that, at a meeting held on May 25, it was decided by a unanimous vote not to build on the fosse."

The Committee have also been in communication with the Ordnance Survey with a view to obtaining more full and accurate delineation of ancient remains in the ordnance maps; an object with which the Directors of the Survey are entirely in sympathy, but observe on the difficulty experienced by the surveyors in obtaining accurate archæological information in regard to such remains.

Lord Balcarres is the President of the Committee, and Mr. I. Chalkley Gould, F.S.A., the Hon. Secretary. Communications can be addressed to the Royal Societies Club.

LONDON BUILDING ACT TRIBUNAL OF APPEAL:

THE METROPOLITAN RAILWAY COMPANY *v.* LONDON COUNTY COUNCIL.

ON Thursday last, at the Surveyors' Institute, Great George-street, Westminster, the Tribunal of Appeal heard an appeal by the Metropolitan Railway Company against the certificate of the Superintending Architect of Metropolitan Buildings, dated June 11, 1906, defining the general line of buildings on the south-east side of Euston-road, St. Marylebone, between Cleveland-street and Bolsover-street, and on the western side of Cleveland-street aforesaid, between Euston-road and Buckingham-street.

Mr. Macmorran, K.C., and Mr. Cunningham Glenn appeared for the Metropolitan Railway Company; Mr. Whateley for the owners of 365, Euston-road; and Mr. Ricketts for Watney, Coombe, & Co., were interested in a public-house in the road. The London County Council was represented by Mr. Horace Avory, K.C., and Mr. Moresley White.

Mr. Macmorran, in opening the case for the Metropolitan Railway, said that his clients were owners of certain lands and buildings in Euston-road which they acquired under an Act of the year 1898 for ventilation purposes. The Company were now desirous of rebuilding on the site, which was at the corner of Cleveland-street and Euston-road. They did not take any objection to the building line laid down in respect of Cleveland-street, but they asked the court to say that the Superintending Architect was altogether wrong as to the line of building which he had laid down for Euston-road. As fixed, the line would cut clean through buildings belonging to the Company, and would go right through the middle of a public-house. His contention was that it was no part of the duty of the Superintending Architect to fix a building line—all he had to do was to determine judicially where the line was. The existing buildings at the present time came up to the pavement, and his (learned counsel's) contention was that the general line must be determined having regard to the existing buildings. That had not been done in this case, and he, therefore, asked the court to say that the Superintending Architect was wrong.

Mr. Whateley next addressed the Tribunal, and maintained that it was impossible to suggest that the building line in the block between Southampton-street and Cleveland-street was so set back as to form a recess or crescent. All that could be said about that block was that some of the buildings did not come as far forward as the general building line in the street. It was impossible to argue that because one house was set back a little from a neighbouring house, that that one house altered the general building line of the street.

Mr. Matthew Garbutt, F.R.I.B.A., gave evidence in support of the appellants' case. He said there were certain houses that were set back betwen Bolsover-street and Southampton-street, but, in his opinion, the building line was the same as in the other parts of the street from Tottenham Court-road up to the pavement. If the certificate of the Superintending Architect was adhered to, it would mean that the building line would cut through part of 179, Cleveland-street, which was a three-story building; also adjoining premises of one story, and it would also cut into a corner building of three stories near the public-house. The line adopted by the London County Council architect ignored the existing buildings of the Metropolitan Railway Company.

In cross-examination by Mr. Avory, witness said he was not aware that 381, Euston-road was erected under a consent given by the old Metropolitan Board of Works in April, 1864. He admitted that, as regarded that portion of Euston-road between Southampton-street and Bolsover-street, all the buildings that were in front of the Superintending Architect's line were one-story buildings, mostly of corrugated iron.

Mr. A. R. Stenning, F.S.I., F.R.I.B.A., said that, in his opinion, the line determined by the Superintending Architect altogether ignored the buildings betwen Bolsover-street and Cleveland-street. In his judgment the general building line came up to the back of the pavement, and was substantially the line fixed by the Tribunal of Appeal for the Euston-road, some years ago.

Replying to Mr. Avory, witness said that, if it was a fact that 381, Euston-road was erected under a consent of the old Board of Works that would constitute the general building line, in his opinion. He admitted that there were breaks in the building line on the south side of Euston-road.

Mr. Rowland Plumbe, F.R.I.B.A., in reply to Mr. Whateley, said he had resided in Fitzroy-square at the back of Euston-road for nearly forty years. In 1869 he made a survey of the buildings as they existed then from the forecourt of 365, and they were in exactly the same position as they were now. He totally disagreed with the building line as laid down by the Superintending Architect of the London County Council.

For the respondents Mr. Avory called Mr. F. J. Lancaster, a chief clerk in the Building Act Department of the London County Council, who put in the papers relating to the consent given by the Metropolitan Board of Works for the erection of the buildings in Euston-road, already referred to.

Mr. Avory, for the London County Council, said the contention of Mr. Macmorran really came to this: That it was improper for the purpose of defining a general building line between Cleveland-street and Bolsover-street to draw any line which cut through any existing building. A conclusive answer to that was that the Tribunal had, in many instances, defined a building line which cut through existing buildings. In the case in question they had the further fact that some of the buildings which were at present in advance of the line laid down by the Superintending Architect were either unlawfully there, or were there because they had been erected under a specific consent given by the Board of Works, which he (learned counsel) submitted was conclusive evidence that, at the time they were erected, they were in front of the general building line. Looking at all the circumstances of the case, he submitted that the Superintending Architect was entitled to take into account, in fixing the general building line, the buildings at the corner of Bolsover-street, the public-house, and 177 and 179, Cleveland-street. It was a very plausible argument that the building line ought not to cut through buildings which had existed for years; but when that was done, and the owner was called on to rebuild, the London County Council was bound to pay him compensation under sect. 23 of the Act.

Mr. Macmorran, Mr. Whateley, and Mr. Ricketts, having again addressed the Tribunal, the President announced that the court would consider its decision.

The International Congress of Architects.

THE Congress commenced at ten on Monday morning by an "Informal Reception by the President" at the Grafton Galleries. The main object of this arrangement was to afford an opportunity for all the visitors to make the acquaintance of the President and to be able to inform themselves as to the arrangements of the bureau and find out from the commencement where to go for any information as to the proceedings. The arrangement answered very well; a large number of visitors, English and foreign, attended, and after presentation to the President were able to look about them, to meet friends or be introduced to those whom they knew by name but not by sight, and to inspect the manner in which the Grafton Galleries had been utilised for the purposes of the Congress.

The system has been to make the Grafton Galleries the headquarters for everything, the bureau being formed at the end of the large room, and the telegraph and post-office in the Octagon Room. The large room was the place for most of the sectional meetings, where papers were read and discussed; the lower end of it became unavoidably a passage, but owing to the size of the room this did not appear to cause any inconvenience to the proceedings at the daïs end. The sectional meetings which were carried on simultaneously with those at the Grafton Gallery were held at the Institute rooms, which otherwise were not in use, everything else being concentrated at the Grafton Galleries. There could not have been a better place, both on account of its central position and its numerous and well-lighted rooms. It is satisfactory to record this, as we know that the choice of central quarters had given the executive committee a good deal of anxiety; various places were proposed and examined with this object and rejected as unsatisfactory, and we think the final choice could not have been better.

Of the various rooms at Grafton-street, besides the large gallery, the long galleries beyond it on the ground floor were hung with the remarkable collection of historical illustrations of English architecture, of which we have spoken more fully on another page; the large room in the basement was utilised for the illustrations of contemporary architecture, and the collection of old furniture and silver work; in the basement also was found place for the ladies' room, which we imagine must have been everything that the lady visitors could wish for, if we may judge from what we heard of the consultations and undertakings with reference to it. Various members of the ladies' committee also made themselves kindly serviceable to the foreign visitors at the first meeting by acting as interpreters to those who had no English, a service which was evidently appreciated in the most cordial manner.

At the Guildhall meeting on Monday afternoon the President and members of the Executive Committee, and the Lord Mayor and his retinue, waited at the door of the side gallery for the Duke of Argyll and the Princess Louise, and on their arrival Mrs. Belcher presented the Princess with a beautiful bouquet on behalf of the Ladies' Committee. The whole party then passed up the staircase and through the picture gallery to the platform of the Great Hall, which was occupied by a crowded audience.

Inaugural Meeting at the Guildhall.

The inaugural meeting at the Guildhall was held by permission of the Right Hon. the Lord Mayor and the Corporation of the City of London, and a large gathering of members of Congress and ladies assembled at three o'clock, and H.R.H. the Princess Louise and His Grace the Duke of Argyll, K.C., were received by the Executive Committee and the Ladies' Committee. Among those present were the Lord Mayor and Lady Mayoress and the Sheriffs, the United States Ambassador, the Greek Minister, Sir L. Alma-Tadema, R.A., Sir W. B. Richmond, R.A., Sir Aston Webb, R.A., Sir William Emerson, Professor Aitchison, R.A., Mr. Alfred East, R.A., Mr. Reginald Blomfield, A.R.A., Sir John Taylor, Mr. Mervyn Macartney, Professor Baldwin Brown, Professor S. H. Capper, Mr. H. T. Hare, Mr. John Slater, Mr. H. H. Statham, and many others, and, in attendance on the Princess, the Hon. Nona Kerr and Capt. Geoffrey Probert.

The chair was subsequently taken by the Right Hon. the Lord Mayor, who briefly welcomed H.R.H. the Princess Louise and His Grace the Duke of Argyll, and then surrendered the chair to the chairman of the meeting, the Duke of Argyll, who called upon Mr. John Belcher, A.R.A., President of the Royal Institute of British Architects, to deliver a

Presidential Address of Welcome.

Mr. Belcher said: Your Royal Highness, my Lord Duke, your Excellency, my Lords, ladies, and colleagues,—As President of the Royal Institute of British Architects I have the honour of being invited to preside over the work of this the seventh International Congress of Architects, and on behalf of the Executive Committee I take the earliest opportunity to heartily welcome the distinguished delegates and architects who have honoured this country by their presence, and to assure them of our high regard and esteem.

I feel sure that the members of the Congress will be gratified to know that His Majesty King Edward VII. has been graciously pleased to be the patron of the Congress, that the Prince of Wales has consented to be its Hon. President, and that the Royal family have in other ways shown an interest in our proceedings which has been, and will continue to be, a great incentive and encouragement to us.

The Royal Princess whose kindly and gracious presence we welcome amongst us to-day is not only herself a distinguished sculptor, but has shown a keen and discriminating appreciation of art in all its forms. The artistic tastes and interests of the Princess Louise are as well known to our *confrères* from other lands as they are to us.

Gentlemen, I have every hope that our deliberations will prove of great interest and value, and will tend to the advancement of our beloved art throughout the world. It is by interchange of ideas, comparison of methods, and the statement of experiences under new and changing conditions that that advancement will be assured. These Congresses, therefore, may be expected to bring in their train fresh life and vigour, increased enthusiasm, broader views, and new ideas which cannot fail to benefit the community at large. I say "community" advisedly, because the fact is beginning to be recognised that architecture as a fine art is not, or must not any longer be, one of the luxuries of the rich, but is of vital importance to the physical and moral well-being of all sorts and conditions of men, especially in cities and large towns. Environment is a tremendous factor in education and development. A man's surroundings have enormous power over him, whether for good or for evil; a power that acts continuously, without cessation—almost, we may say, by day and by night. This fact is being more and more clearly recognised every day, and efforts, we hope, will be made to introduce a stricter supervision over buildings of every kind, that a better order of things may gradually be created.

But here, at the very outset, we are confronted by a popular misconception concerning the true nature of architecture. In past years public interest has been almost limited to the scientific side of the question, viz., that houses and other buildings should be well built, sound, and wholesome; that drainage and ventilation should be carefully attended to, and other so-called "practical" matters. Occasionally, and more frequently of late, a certain amount of ornament and so-called style has been demanded, and this has been thrown in or daubed on afterwards, and the result dignified with the name of architecture. Such work is not true architecture at all. It is mere building—sound and good, perhaps, but still mere building—plus certain ornamental and decorative features. Now, if our architecture is to be an elevating and refining influence; if it is to be an enduring power for good; still more, if it is to be a witness to coming generations of earnest purpose and high aspirations, of moral power and intellectual greatness, the artistic element must not be something merely added; it must interpenetrate and blend with scientific knowledge and experience from the very first.

Architecture is both a science and an art, and the mathematical symbol of the relation between the two is not that for mere addition (+), but for multiplication (×). In other words, science supplies the facts and the laws which art takes and presses into the service of noble ideals. The scientific and artistic elements in a good building may perhaps to a certain extent be distinguished, but they cannot be separated; they are as inseparably connected as mind and body.

The primary motive for all building lies in the practical needs of life, in the demand for shelter and comfort; but the architect's work calls for a much wider range of thought and purpose than is necessarily implied in such provision. If the task entrusted to him is to be honourably as well as adequately fulfilled he must be an artist, with an artist's motives, aspirations, and ideals, as well as a man of practical skill and scientific knowledge. In this way the elementary necessities of life may be made to serve high and noble ends, and much that is elevating and refining may be brought into the lives of the people as a silent but continuous power for good. Their homes, the streets they traverse, and the buildings they work in may all be made, as Lord Leighton once observed, to contain "the fire-germ of living beauty," quickening and invigorating the deep springs of health and joy.

The proceedings of this Congress and the publicity attaching to them will help, we trust, to bring this important subject into greater prominence; and we shall, I am sure, find, as we have often before found, the public Press most ready and most powerful in helping on anything that concerns the common weal.

It may perhaps be as well here to inform those of our honoured guests who are not yet aware of the fact that in this country we have no Minister of Fine Art or similar authority to watch over the interests of the public in this respect of the art, as distinguished from the science, of building. We have a "First Commissioner of Works," it is true; but, however able and enlightened he may be, tradition and custom limit his activity and his authority within certain fairly well-defined lines. There has been, however, of late, amongst the educated portion of the public, a wonderful awakening to the interest and value of architecture as a fine art. On all hands we discover a receptive spirit, a disposition to inquire, and a readiness to learn something of the mystery of our art—not merely to admire and study its past achievements, but, treating it as a living art, to ascertain its true functions and vital principles. Everywhere intelligent men are asking how they may distinguish between good and bad; and asking, too, *why* this is good and that bad.

We are taking steps to supply the public with some simple criteria of a general character which may serve as a basis for the formation of a critical taste and sound judgment, and the question of how best to carry this out is a subject that will come before the Congress for consideration and discussion. If we can thus give the public an insight into some of the living principles of our art—and here I beg to emphasise the word "living"—we shall unlock to them a veritable storehouse of interest and information. For no man has a richer field lying before him for exploration and research than the man who takes an intelligent interest in architecture, who can appreciate its points, and decipher its meaning. Everywhere, at every turn, he finds a new "subject" to exercise his perceptive and reflective faculties upon. Every

truly good work will be to him a fund of information, as well as a revelation of character and purpose. He will read the mind of a people in their buildings, and understand the social conditions that prevailed in each age. For all true architecture is instinct with life, the life of its people and of its age. We may study the thoughts and purposes of past generations, not only in their poetry and their prose, but also in the architectural work that they leave behind them. No historian's verdict is more reliable than that which is written with a pen of iron in brick and in stone.

How much have we learnt of the brilliance of Greece and the majesty of Rome from the monuments of their architecture that have survived! So also our buildings tell of our daily life and doings, of our noble aims or our sordid interests, of our broad, large-hearted views or of narrow-minded selfishness. A private residence is an index to the character, tastes, and disposition of its owner. So, too, our public buildings will declare aloud to after generations the ideals and sentiments that govern our municipal and national life.

The educational value and historical interest and importance of architecture are enhanced by the fact that, unlike literature, architecture is cosmopolitan and universal in its language; its great works, its priceless treasures, are open to be known and read of all. Every nation, it is true, has its own accents and its peculiar idioms even in architecture; but this is to be counted for a gain rather than a hindrance by the man who visits other lands. As he travels from one country to another, or even from one city to another, he finds an infinite diversity of expression, throwing an ever-shifting light upon the various aspects and sides of human life and thought and feeling. Many a record of the past, too, is opened to his eyes, speaking of men and manners that have passed away.

The study of architecture may indeed be made one of the most entrancing of pursuits; but if it is to be delivered from that touch of pedantry, that archæological flavour, that so often clings to it, the student must be brought into contact with living principles. The monuments of the past, as well as the work of to-day, must be read and judged in the light of those principles that hold good for every age and for every nation.

In addressing my brother architects from other lands—and I am proud to see so many distinguished men amongst them—I may venture to point out that our architecture, like that of other nations, has a distinctive character of its own, being of a severer and graver type than is found elsewhere. This is partly accounted for by the dull grey atmosphere which so constantly wraps us round, by the comparative rareness of clear and sunny skies, and our generally unfavourable climatic conditions; but I am afraid we must not throw all the responsibility upon nature. We are insular in character and disposition—there is no doubt about it—and more so perhaps as individuals than in our corporate life. Every man is his own island—a sort of moated grange, in fact, with the drawbridge habitually raised. We are reserved and apt to shut ourselves up within ourselves. In our railway trains, and even in our clubs, we sit apart in silence, or merely throw remarks at one another over the top of the morning paper. We habitually repress our emotions and hide our feelings. Naturally, therefore, our buildings also are often stolid, even grim and forbidding, in appearance; they lack the charm and brightness which distinguish the architecture of other and sunnier lands. We hide them away, too, in back streets or (if they be in the country) behind high walls and as many trees as we can press into the service.

But let me hasten to add that I have a purpose in speaking of these external characteristics of British architecture, and that is to beg my illustrious *confrères* from abroad not to stop at the external features, but to pursue their researches a little further, and they will find set forth in our buildings another characteristic of the people of the land they are honouring with a visit. Under a somewhat grave and sedate appearance it will be found that our people possess warm hearts. Once within the doors of their houses there will be no lack of a heartiness of welcome and a sincerity of goodwill which may be firmly relied upon. The many mansions and other beautiful residences with which our country abounds reflect this deeper element of our hearts and lives, and will be found worthy of your notice.

I believe it is generally agreed that our modern domestic buildings present a noteworthy development of our art, and one that is almost peculiar to this country. We cannot show you streets leading to public buildings of such stately character as may be seen and admired in other great cities of Europe, and our public buildings themselves are consequently at a disadvantage. The new approach to Buckingham Palace and the memorial to Queen Victoria—designed by Sir Aston Webb—show what might be done if only such opportunities were more frequently given. Had Sir Christopher Wren been allowed to carry out his plans for laying out the City after the Great Fire there would have been no lack of fine streets to show you, or of splendid vistas opening up to view every building of importance. But there was no Minister of Fine Arts to turn the scales in favour of an enlightened policy!

Having drawn attention to some of the features and conditions of British architecture, let me acknowledge, on behalf of my countrymen, how much we have learnt from, and how much we have profited by, the many splendid examples of architecture which are to be found and admired in your respective countries. We naturally and instinctively turn to the south for that which is bright and beautiful. The warmer temperament of the southern artist is favourable to productive fancy. We see that the nations amongst whom the love of beauty is a national trait, instinctive and inherited, seek it in all their works, and set forth their national greatness in their public buildings—an element in the education of the people which no Government can afford to despise.

The union of the arts in which we believe the secret of your success to lie is not so advanced amongst us as with you; but signs are not wanting even here of the growth of a closer bond between them, and architects and sculptors will be found collaborating on a building to present its distinctive purpose with greater clearness and beauty before the eyes of men. The utilitarian cast of mind, running ever in its one groove, may laugh or even sneer at this; but from a national as well as humanitarian standpoint there can scarcely be a greater mistake than to overlook and neglect the emotional side of man's nature. The greater the advance in civilisation, the more pressing the claim of the emotions of the people to due recognition and well-balanced development on true and right lines. Feats of engineering, appealing to the intellect, astonish but do not move us; but works of beauty, buildings of graceful proportion and appropriate design, lift the beholder above the vulgar and commonplace into a higher region, and fill the heart with lofty ideals and pleasurable emotions.

The aim and purpose of the Congress is the welfare of the people. This can only be accomplished by raising the ideal both of architects and the public, by setting a higher tone and proposing a nobler end for all work, and thus lifting that which would otherwise be blankly material, utilitarian, and commonplace into the region of the beautiful, the elevating, and the inspiring.

In conclusion, permit me once again to offer you all a heartfelt and most cordial welcome. I trust that the Congress will be a great success, and that your visit to London will prove both a profitable and an enjoyable one.

Vote of Thanks to the Lord Mayor.

At the conclusion of the Presidential address, Sir Aston Webb, R.A., proposed a vote of thanks to the Lord Mayor and the Corporation for their great kindness, he said, in lending that noble hall in which to hold the inaugural meeting of the Congress. That hall, as many of them knew, was first built in 1211; it was rebuilt in 1326, and once again in 1411. After that it suffered severely from the Great Fire of London, and once again it was restored. It suffered again somewhat severely when George Dance, the architect, added a Gothic front to it. George Dance, he might say, was an architect who did most admirable work at the Mansion House, and who also designed Newgate Prison, which would never be seen again. The hall had been the scene of many historic ceremonies, the greatest sovereigns of the world and many of England's most distinguished sons having been received in it, and Gog and Magog had looked on at all these ceremonies unmoved. There was a tradition, he did not know how true it was, that when once Gog and Magog heard the clock strike one they would come out into that hall; but at present they remained where they were. It was because of the great traditions and the great associations that that hall had and with which no modern building could possibly vie, that they had been asked to meet there that day, and he asked them to pass a most hearty vote of thanks to the Lord Mayor and Corporation for their great kindness and courtesy in allowing them to do so.

The vote of thanks was then unanimously agreed to, and the Lord Mayor, in reply, said that he had, on behalf of the Corporation, great pleasure in receiving the vote of thanks. He need hardly say that it was a great pleasure to them to place the hall at the disposal of the Institute for the admirable work which had been inaugurated. He, the Lady Mayoress, and the Sheriffs had, unhappily, to take their leave in order to attend to other duties, but he hoped to meet many of them at the Mansion House the following evening.

The Lord Mayor and the Sheriffs then retired.

Report of the Secretary of the Congress.

Mr. W. J. Locke, secretary of the Royal Institute of British Architects and secretary of the Congress, then read the following report:—

Your Royal Highness, Your Excellencies, my Lord Duke, my Lord, ladies and gentlemen,

The Executive Committee has the honour to present to you the official report of their labours in the form of this programme, supplemented by a brief summary which it is my duty and privilege to lay before you as their executive officer.

The Permanent International Committee at their meeting in Madrid, at the close of the Sixth International Congress of Architects, decided that the seventh Congress should take place in London, and that the Royal Institute of British Architects be invited to undertake the task of its organisation. Nine representatives of the Royal Institute were appointed as members of the Permanent International Committee, and, the Royal Institute having accepted the invitation, appointed six other representative architects to join the nine, and thus form the Executive Committee of the Congress.

The work of organisation began by the Executive Committee asking the premier architectural societies of the world to issue circulars of propaganda to the architects practising in their respective countries. By their generous and loyal help over 25,000 circulars were distributed, the invitation to join the Congress was printed in every architectural journal, with the result that practically every practising architect the world over had the Seventh International Congress brought to his notice.

The Executive Committee have departed from tradition in according to ladies practically full privileges of the Congress at a special subscription.

The Committee are proud to record the fact that the number of members has reached the figure, unprecedented in these Congresses, of nearly 1,700. Of these 700 are from foreign European countries, America, and the British colonies.

The Executive Committee have to mention to their colleagues from other countries the fact that the British Government stands aloof from participation in the organisation of congresses of this kind. It neither subventions them nor invites foreign Governments to appoint official delegates. The guarantor of the Congress is the Royal Institute of British Architects, and foreign Governments have been approached semi-officially through the independent action of the Executive Committee acting under the authority of the Royal Institute.

The foreign Governments who have in these circumstances appointed delegates are as follows:—Belgium, M. J. M. Caluwaers (Président de la Société Centrale d'Architecture de Belgique); Denmark, Etaatsrael

Vilhelm Dahlerup; France, H. Daumet and J. M. Poupinel; Greece, Nicholas Balanos and Anastase Metaxos; Holland, Joseph Theodore Cuypers; Hungary, Julius Berezik and Alexandre d'Aigne; Italy, Mariano Edoardo Cannizzaro and Commendatore Alfredi d'Andrade; Russia (Académie Impériale des Beaux Arts), M. le Comte Paul de Suzor and Léon Bénois; Spain, Richard Velasquez Bosco and Luis Ma. Cabello y Lapiedra; Sweden, Professor J. G. Clason and Kaspar Salim; United States of America, Frank Miles Day, Francis R. Allen, Glenn Brown, George O. Totten, jun., William S. Eames, W. L. B. Jenney, and George B. Post. Besides these Government delegates, there are 101 bodies in Great Britain and abroad who have appointed 159 delegates, and these range from the Technologforeniger in Sweden to the Institute of Architects of Japan. The list, whose recital would be tedious, is given in the official programme.

The programme of the Congress can be divided into two sections, work and social intercourse.

There are ten subjects to be discussed, carefully chosen by the Executive Committee as subjects of universal importance to architects, without regard to conditions peculiar to any one nation. Sixty-two reports on these subjects have been contributed by representatives of every country in Europe and America. The time at the disposal of the Congress will not allow all these sixty-two papers to be read, and the Executive Committee have had to make a careful selection. Printed abstracts, however, of all communications are in the hands of every member, and those which are not read will be printed *in extenso* in the Comte-Rendu. There will be discussions after the reading of the selected papers, and the committee hope that the result will be an invaluable exchange of thought between the members of the architectural profession of the civilised world.

The opportunities for social intercourse afforded by the Congress are numerous. The following may be specially mentioned. The Royal Academy are generously giving a reception to the Congress in their galleries to-night at Burlington House. The Lord Mayor is kindly receiving the Congress to-morrow evening. The Royal Institute of British Architects are entertaining the Congress at an evening garden party on Thursday.

The Executive Committee have organised visits to many places which they think will be of interest. The Athenæum, the Arts Club, the National Liberal Club, the Lyceum Club (for ladies), the Art Workers' Guild, the Zoological Society, the Royal Botanic Society, the directors of the Austrian Exhibition at Earl's Court, have all offered in their several ways their hospitable welcome to members of the Congress. There will also be a farewell banquet on Saturday, the 21st.

The Executive Committee therefore venture to hope that the arrangements they have been privileged to make for the instruction and entertainment of the Congress will meet with your approval.

In conclusion, I have the honour, on behalf of the Executive Committee, to call upon the representatives of the various countries to reply briefly to the President in the following order; after which His Grace the Duke of Argyll will deliever his inaugural address.

Replies of Foreign Representatives.

Replies by the representatives of the following foreign countries were then made:—

Austria, Prof. Otto Wagner; Belgium, Monsieur J. J. Caluwaers; Denmark, Etatsraad Vilhelm Dahlerup; Holland, Mynheer J. T. Cuypers; France, Monsieur H. Daumet; Germany, Herr H. Muthesius; Greece, M. A. Metaxas; Hungary, Monsieur J. Berczik; Italy, Prof. d'Andrade; Japan, Mr. S. Chujo; Portugal, Senhor Ventura Terra; Russia, M. Robert Böker; Spain, Señor Don Velasquez Bosco; Sweden, Prof. Clason; United States, George B. Post.

Each gentleman in turn made a neat little speech of commendable brevity. The speakers mostly contented themselves by expressing the pleasure they felt in representing their various societies and countries on this occasion, the honour they felt it to be present, and concluded with expressing their best wishes for the success of the Congress. Several referred with enthusiasm to the excellence of the collections in our museums, and others were not less favourably impressed by our modern English buildings.

Herr Otto Wagner (Austria) said he felt it an honour to greet the august assembly, and on behalf of himself and his fellow-countrymen, he expressed his pleasure at the opportunity afforded by his English *confrères* for the discussion of interesting questions both artistic and scientific relating to the art of architecture.

Monsieur J. J. Caluwaers (Belgium) expressed his best wishes for the success of the Congress, and gracefully greeted all present, especially the foreigners. He hoped that the questions to be discussed might receive satisfactory solutions. He was pleased to know that many of his fellow-countrymen were present, and, in their name and his own, he wished to tell his English *confrères* how much Belgians admire English buildings, and he enumerated various specimens. He congratulated English architects on the modern buildings in which they showed themselves to be worthy followers of their great forerunners, and he laid great stress on the splendid collections in London museums.

Mynheer J. T. Cuypers (Holland) reminded the assembly that his own late King had been received many years ago in this same hall, and he welcomed the present occasion as a further sign of international fraternity. He called to mind that there are many bonds of sympathy between Holland and England, and that various points of similarity in the design of houses and furniture are an added proof of the community of feeling which exists between the two countries.

Monsieur H. Daumet (France) expressed his pleasure at representing not only his country in general, but the Ecole des Beaux-Arts in particular. He paid homage to King Edward, and pointed out how the presence of the King's sister was another sign of Royal sympathy for art. He laid great stress on how the importance of its architecture testifies to the greatness of a nation, and how the progress of civilisation is assisted by the buildings raised for the advancement of education, art, and science. He also congratulated us on the unrivalled collection of classic work in the British Museum, and the benefit which must accrue to students from the observation of those superb models.

Herr H. Muthesius (Germany), speaking in English, said that, in the name of German architects, he returned sincere thanks for the kind invitation which brought them there, and the kind words of welcome addressed to them. German architects attached considerable importance to the transactions of the Congress, and they looked forward to getting a greater knowledge of English work and art, and that had induced some of them to accept the invitation to the Congress. They all knew that English architecture was full of interest and merit, and of great international importance. They knew especially how much the world had to learn from England in domestic architecture from which ideas were emanating and revolutionising the whole world of architecture; and if he might be allowed to express a wish at the beginning of the Congress, it would be to suggest that foreign representatives should be shown specimens of the best English domestic architecture of the day. He hoped that the Congress would be as great a success in the architectural sense as in the sense of establishing a cordial feeling between all the nations represented there that day.

Monsieur M. A. Metaxas (Greece) expressed the thanks of the Greek Government for the honour of an invitation to attend the Congress, and cordially hoped for the success of the same.

Monsieur J. Berczik (Hungary) echoed the same sentiments.

Professore d'Andrade (Italy) brought the greetings of the Italian Government, and expressed his sense of the honour conferred on him as its representative. He said that the compatriots of Michelangelo and Bramante were looking forward with much pleasure to seeing the work of the English masters. He hoped that the Congress would contribute to the increase of friendship between the nations, no less than to the advancement of art and science.

Mr. S. Chujo (Japan) said it was a great honour to be present and to address the Congress. The Congress was international, and it showed the necessity for the common brotherhood of the art, and of the human happiness of the world. Japan, like other nations, had its own national architecture, which was very different from the architecture of western nations; but western civilisation had brought a change in Japan in many respects, and architecture had to play its part in that change. They would watch the growth of architecture in their country, and would strive to influence it in the proper direction. He hoped to see a future Congress in Japan, and to see them all there.

Senhor Ventura Terra (Portugal) expressed the honour he felt it to address the meeting, reminded his hearers of the friendship existing between the Sovereigns of the two countries, and hoped that those feelings were shared by the nation at large no less than by his *confrères*. It was particularly agreeable for himself to voice these friendly feelings, and to acknowledge the pleasure he experienced at being in this country.

M. Böker (Russia), who spoke in excellent English, said he had the honour to convey to the Institute of British Architects the cordial greeting of the Imperial Society of Russia, and to return thanks to the Institute for the invitation to attend the Congress. Most respectfully he expressed their profound gratitude to His Royal Highness the King for consenting to become the President of the Congress, which showed the interest the King took in the progress of their art. He (the speaker) personally appreciated the privilege of meeting so many distinguished architects assembled from all parts of the world to discuss architectural questions of universal importance and interest, and he knew from past experience how warm-hearted and sympathetic was the welcome hospitable Englishmen invariably extended to all foreigners, and he could not help feeling impressed by the cordial reception in this the greatest city the world had ever seen. He wished prosperity and long life to the Royal Institute of British Architects.

Señor Don Velasquez Bosco (Spain), in a more lengthy speech than most of the others, said he found it a most agreeable task to bring the greetings of his society in particular, and of his *confrères* in general. He expressed a hope that the Congress would increase the friendship and kindliness which had so long existed between our countries.

Professor Clason (Sweden) made quite the most flattering speech of all the representatives. He expressed his pleasure at being sent by the Swedish Government and his thanks to the Institute for their kind invitation. He was glad of the opportunity given him to voice his great sympathy with, and admiration of, the taste and skill displayed by the English in their architecture. He was sure that he spoke in the name of all the visitors when he gave expression to the pleasure they felt in observing how the designs were based on historical tradition, combined with rational construction. And he was sure that a Congress organised by such past masters could not fail to be an equal success.

Mr. George B. Post (United States) said it was a distinguished honour to represent his country on the occasion. He had lived long enough to see the development in America from nothing of the great profession of architecture. He well remembered the time when the architect in America was a man of no consideration—as a man of affairs, as an engineer, and, still less, as an artist. To-day architects in America were numbered by thousands—men engaged in all matters connected with building, and they were respected by the community. As representing for the time the architects of his own country he desired to pledge them to do their best for the advancement and the ultimate perfection of the art they loved—the most exacting and the most comprehensive of the arts.

Inaugural Speech by the Duke of Argyll.

The Duke of Argyll said he should emulate the brevity of the foreign delegates, whom, on their behalf—and the Princess associated herself with him—he most cordially welcomed, and he hoped they would spend a very pleasant time in England. The Princess had never been so greatly daring as to make designs and become the architect of any great building, but it had been her pride to interest herself in the sister art of sculpture. It was a very great pleasure to converse with

an architect, for in doing so one had a feeling as if one were building a house—one of the joys of this life. It was a joy if one built it with one's own gold, and so much the greater joy if one could build it with one's friends' gold, and if one could dip one's hand into the Treasury and build it with the money of the public purse, that was the supremest joy of all. Architecture was a great art, one which allowed of no shirking. There was no such thing as impressionist architecture. It was an art which was thorough, real, and earnest. He did not think they need be ashamed of what they could show their friends from abroad in the shape of English architecture, notably perhaps in church architecture. One of the greatest of American generals, when asked what he liked best in his recollections of the old country, said, after a pause:—"The seven lancet windows of York Minster." But in other buildings he thought we could hold our own, as we did in that Guildhall, and under the shadow of the fabrics erected by Wren and by Barry. We must, however, remember the country from which so much of our inspiration came—namely, Italy. It was, after all, not so very long since we were a province of Rome, and beneath the surface of this country, if one were to dig down, there would be found any amount of Samian pottery and other indications of the Italian people whence we got our inspirations. They, on their side, were indebted to the colonists who came to them from Egypt and also from Greece. When they thought of Italy, they must think of the magnificent mediæval fortresses and fortress-houses in Genoa, in Florence, and in Rome. And then, again, when they thought of France, let them think of those marvellous châteaux on the Loire and elsewhere. Let them think again of the triumphs of Spain, of the Escurial, and of other magnificent buildings, not to speak of those in the Low Countries nearer home. In the future it might be surmised that, in our domestic architecture, we should be compelled by our motor-omnibuses and our traction engines to go back to a more ancient system of architecture—namely, rooms within a court. And there was another great development which he did not think had been alluded to—*i.e.*, in buildings which could not strictly be called architecture—and that was in the curious fabrics arising here and in America—buildings in a steel cradle. We had had experience of the disastrous effect of earthquakes on buildings—recently in San Francisco—and such structures as these seemed to stand earth tremors better than others, and it might be that buildings would be built like the earth itself, with rock and with steel running through it, and buildings of this kind might become a feature of future architecture. He hoped they would meet the present company again—in another country, if not in this.

Mr. Belcher then proposed a vote of thanks to H.R.H. the Princess Louise and His Grace the Duke of Argyll for their kind interest in the Congress. They were grateful to the Princess for her thought and interest and sympathy in architecture as a fine art, and to the Duke for presiding, and for his remarks.

The vote of thanks, having been heartily agreed to,

The Duke replied, and mentioned that, by the courtesy of the Lord Mayor and Corporation, the Guildhall Art Gallery, containing a valuable collection of works of Belgian painters, was thrown open to members of the Congress.

The proceedings then terminated.

At the close of the proceedings the foreign representatives were successively presented to the Princess, who shook hands with each of them.

Soirée at Burlington House.

The reception given by the President and members of the Royal Academy at Burlington House in the evening was very largely attended, but calls for no special description; it was on the same lines as the usual Royal Academy Soirée—a band playing in the Lecture-room, a continual circulation of visitors through the galleries, and a liberal provision of refreshments downstairs. Everyone arrived much at the same time, so that there was a crush at entering, but otherwise the rooms were at no time inconveniently crowded.

TUESDAY'S PROCEEDINGS.

The proceedings of the Congress were resumed on Tuesday, when meetings were held in the rooms of the Royal Institute of British Architects, No. 9, Conduit-street, and in the Grafton Galleries. At the Institute rooms Mr. Reginald Blomfield presided, and the first paper read was by M. Honoré Daumet, Membre de l'Institut de France, and the title of his paper was "Notice sur le Château de Saint-Germain." Signor Cannizarro was the foreign chairman, and the hon. secretaries of the meeting were M. C. V. Bartaumieux, Paris, and Mr. Harbottle Reed, England.

In introducing the lecturer, the chairman said he had great pleasure in introducing to them a very distinguished architect, who had been good enough to be present that day. He was the doyen of the Institute of France, and fifty years ago he won the Grand Prix, and his career since then had amply fulfilled the brilliant promise of fifty years ago. Both as a scholar in architecture and as an architect he had done distinguished work. He had practically rebuilt Chantilly, and for a good many years he had been engaged on the great historical Château of Saint-Germain. That building was second only to Fontainebleau in historical interest, and it was of peculiar interest to Englishmen because it was the last refuge of the Stuarts, and for many years it was a rallying place for all the followers of that unfortunate family. M. Daumet had a great deal of interest to tell, and there was no one who knew more about the building than he did.

M. Daumet then read his paper, of which the following is an abstract:

Château of Saint-Germain.

The origin of the Château de Saint-Germain-en-Laye, one of the most important that France possesses, is not known for a certainty. The kings of the first two lines probably came to indulge in the pleasure of hunting in the vast forests which covered the hills at the foot of which flows the Seine, but there is no certainty that they had any buildings there. King Robert I., in the beginning of the eleventh century, founded a church on the high land which dominates the village of Pecq. It is only in the twelfth century that there are positive proofs that there existed a royal residence on the spot where stands the present castle. Louis VI., who reigned from 1108 to 1137, is the first sovereign from whom an authentic document makes known to us his presence at Saint-Germain. His successors made frequent sojourns there; Louis VII., for instance, who resided there in 1143, and held a conference with Henry II., King of England; Philippe Augustus, who made his will there and built the first chapel of the castle. Saint Louis received there in 1247 the Latin Emperor of Constantinople, Baldwin II., who made him a present of relics of the Passion. In order to enshrine them the pious monarch gave orders to build the Sainte Chapelle of the Palace in Paris.

The castle of Saint-Germain was therefore already during the thirteenth century an important royal residence; it was then composed, besides a dungeon, of two blocks of buildings for habitation, placed one in continuation of the other, the foundations of which still exist, and which have been recognised as such by excavations. The chapel of Philippe Augustus being found insufficient, it was replaced in the reign of St. Louis, between 1230 and 1240, by a more sumptuous building, which has remained almost intact until the present time. This is a piece of architecture of remarkable beauty, the merit of which may perhaps be attributed to Pierre de Montereau, who during the same period built part of the abbey church at St. Denis, certain details of the two monuments being identical.

Inhabited successively by Philippe the Bold, Philippe le Bel, and Philippe of Valois, surrounded by a park, the first mention of which is to be found in 1331, the castle was burnt during the English invasion in 1346, but it was not completely destroyed. The chapel fortunately escaped the fire, and steps were soon taken to rebuild from its ruins and to enlarge a residence where the various successive sovereigns were so fond of staying. Charles V. seems to have been particularly fond of the place, and we know that he had important work carried out there; it is to him that we owe the present circumvallation wall which incloses in its perimeter the big dungeon built by Louis VI. and the chapel by St. Louis. This wall, which is fortified in the manner of the period, had the form of an irregular pentagon; it was afterwards used as a sort of sub-basement for the building erected under the reign of Francis I. Inhabited still by Charles VI., the castle was during several years occupied by an English garrison. Subsequently it remained uninhabited during the end of the fifteenth and the beginning of the sixteenth century.

Francis I. gave orders to rebuild it and to follow the surrounding wall of Charles V. The new buildings must have risen quickly, the simplest materials being used for them. The work of the Middle Ages disappeared almost completely, with the exception of the chapel, which was left standing, but which was partly hidden on the side of the apsis by new constructions, whilst the rose window was obscured and crushed by the wall of the Salle des Fêtes, a magnificent hall illustrated in Du Cerceau's precious work, *The Most Excellent Buildings in France*, the original drawings of which are now the property of the British Museum. Du Cerceau does not give the name of the architect who worked under the orders of Francis I., but it is safe to affirm that he was an innovator, because there exists no other type of architecture similar to the work he produced. To convince oneself of this it is sufficient to look at the very original aspect of the exterior, the beauty of the staircases and of the vaults which have been preserved, the majesty and the vastness of proportions of the salle des fêtes, called the Salle de Mars, where the great royal assemblies were held, as well as the festivals rendered so brilliant by the luxury and the elegance which distinguished the Court of the Valois. Henry II., like his father, was fond of Saint-Germain. Philibert Delorme changed the arrangements of the chapel, and Guillaume Marchant began to build the Château Neuf, whence an admirable view was afforded over the Seine Valley. Of the Château Neuf nothing but a pavilion has been preserved, called the Henry II. Pavilion, which contains on the ground floor a curious hall of rustic architecture. In order to put the two buildings into easy communication, a door was made in the southern part of the Vieux Château building which was surmounted by a very fine piece of sculpture, now placed in the Louvre Museum, and which has been faithfully reproduced above the present entrance. The last Valois did not often stay at Saint-Germain so far as can be ascertained. Louis XIV. took refuge there during the Fronde, and there passed nearly all his youth. By his orders Jules Hardouin Mansart added to the castle five large pavilions which completely altered its exterior aspect. The beautiful and original order invented by the master of works of the Renaissance period doubtless impressed the architect of the seventeenth century, who imitated him—a very remarkable fact for that time. Balconies in wrought iron supported by rich consoles were run all round, and the patrols' beats of the Middle Ages were converted into terraces. The castle with its wings built in this manner covered double the former area, and the Court of a luxurious king with its numerous retinue was able to be in residence there. Assemblies were held in the Château, and it is there that were celebrated especially the feasts on the occasion of the christening of the Grand Dauphin, the exact representation of which is preserved to us in engravings of the period.

Being deserted for Versailles, Saint-Germain, since 1689, gave refuge to an unfortunate king. The family of the Stuarts received there the hospitality of Louis XIV. James II. died there in 1701, and his wife Marie d'Este in 1718.

From that time onward the Vieux Château only plays a historic part. Its magnificent Salle des Fêtes was sometimes used for theatrical performances. In 1803 there was a project for establishing a hospital with 800 beds there; later on a cavalry school was established in the building; then it became a military barrack and a military penitentiary. It was only in 1862 that the architect Eugene Millet started the work of restoration which is still going on. The Museum

of National Antiquities, which has been installed in the Castle of Saint-Germain, is a guarantee for the preservation of a monument precious on account of the memories it recalls and for the material traces that French art of the best periods has left there in spite of the alterations and mutilations

The chairman said they had listened to a most delightful paper, but he did not propose to detain them with any remarks of his own, for time was rather short and there were other papers to follow at eleven o'clock. Everyone would have liked to hear M. Daumet at greater length on a subject with which he was so thoroughly conversant.

There being no discussion on the paper,

Mr. R. Phenè Spiers, who spoke in French, said he had been asked to propose a vote of thanks to M. Daumet for the valuable address which he had prepared, and he should have preferred to speak in his own natural language, but as the greater number of those in that room were, if not French, able to understand French better than English, he ventured to propose the vote of thanks in that language. It was not necessary that he should point to the fact, of which they had been able to judge themselves, that M. Daumet had put his heart in this work, which he had had in hand for some years, and some of his life had been passed in working out the problems connected with the buildings and reconstruction and the various changes which had been made in it. In the course of his work at the Château he had been able to make some remarkable discoveries—discoveries which would be of great interest, and he trusted it would be possible to publish a plan of what M. Daumet had found. He had the advantage of going through the building some two years ago with M. Daumet, and seeing all the drawings illustrating it. If a plan could be published it would render the description much more intelligible—a description which dealt with every historical point on which it was possible to throw any fresh light. They owed M. Daumet great thanks for coming there and giving them that discourse, and especially for the elaboration in it.

Signor Cannizarro seconded, and said that they all knew the work of M. Daumet at Saint-Germain. M. Daumet had given them the best example of what ought to be done in a work of restoration. First of all he made himself familiar with the spirit of the time in which the building was erected, and thus, in carrying out the work of restoration, he was able to do the work as though it were being done by the original builders. That was the proper method to follow in restorations of this kind. He thanked M. Daumet not only for his architectural work, but also for his archæological labours.

Mr. E. W. Hudson supported the vote of thanks, and said he agreed with what Mr. Spiers had said as to the one thing wanted to complete their satisfaction being a plan and some illustrations. It was very interesting to him to hear a description of this building, as he understood part of it was the work of Pierre de Montereau. It seemed that there was some remarkable sculpture work in the keystones of the vaulting, especially the head of St. Louis in stone, and it would be most interesting to have illustrations of the sculpture for the R.I. *Journal*.

Lieut.-Col. Prendergast said he desired to associate himself with what had been said by Mr. Spiers. This was no ordinary occasion. It was an international congress of architects, and they were very grateful to those who had come long distances to help them in that which was the backbone of their existence, *i.e.*, the love of architecture. Naturally enough, the first paper came from our friends across the channel, our nearest neighbours. We owe a great deal to France in our architectural work, and he associated himself with the thanks to M. Daumet for his most interesting paper.

The vote of thanks was heartily agreed to.

M. Daumet briefly replied, remarking that he was going to issue a work on Saint-Germain with illustrations.

The sitting then concluded.

The Execution of Important Government and Municipal Architectural Work by Salaried Officials.

Another meeting was then commenced in the same room, under the chairmanship of Mr. John Slater, when papers on this subject were read.

Mr. Slater said it was his pleasure and honour to share the chair with one of the most distinguished architects of Spain, M. E. M. Repulles y. Vargas, of Madrid, whom he had much pleasure in introducing to them.

Mr. Slater then vacated the chair for M. Repulles y. Vargas. The hon. secretaries were Mr. G. H. Fellowes Prynne, England, and Herr Haus Peschl, Austria. Mr. Dircks of the Institute was also assisting at this and the previous meeting.

M. Repulles y. Vargas thanked the Congress in the name of Spain for the honour which they had done him in electing him to the chair, and asked Mr. Slater to read a paper by Herr Otto Wagner, Imperial and Royal Superintendent of Works and Professor of the Imperial and Royal Academy of Plastic Arts, on the "Execution of Important Government and Municipal Architectural Work by Salaried Officials."

Mr. Slater then read the following abstract of the paper in the absence of the author. The paper was on behalf of the Society of Austrian Architects :—

It will be convenient to give first a clear definition of the word "architect" and also some explanation of the process of development of the architect, because all the differences of opinion are more or less rooted in the wrongful acceptation of these conceptions.

With regard to the way in which the architect is developed, it must be taken into consideration that artistic capacities, such as manual proficiency, imagination, taste, individuality, and a certain gift for invention, are faculties which the architect must possess in his quality as an artist, but which cannot be learnt. On the other hand, there are a general culture and a technical and instructive knowledge, which the architect must also possess, but which can be acquired by study.

The amount of scientific knowledge to be acquired by the architect has reached such vast proportions that it has to be divided into parts, consequently into branches of knowledge. For this reason alone it is not possible for the young man who wants to become an architect to acquire full knowledge of all these special branches, since the time at his disposal, and the intellectual receptivity of the individual, are limited.

The architect, during the whole of his professional activity, will cultivate first of all the region of art, which nowadays even in literature has become of a very wide range. But as, at the same time, he is expected to have full knowledge of all technical innovations, his technical and scientific education should extend so far that he will be able to understand the essence of the sciences and their progress, and that this understanding will enable him in his practical work to put the results of human progress at the service of art.

His technical education must, moreover, enable him to choose the proper methods of construction and the most convenient materials to be employed. Nay more, his knowledge, aided by his inborn inventiveness, must enable him to combine new forms of construction, or to vary existing ones so that they shall answer fully the purposes for which they are required. From this it follows that the practical work and experience which the architect gains in the course of his career must be based upon a sufficiently wide knowledge.

Only after having acquired a complete technical education can the question be decided whether the aspirant to the profession of an architect possesses those inborn qualities from which may be anticipated success in following this career.

There is, therefore, a sharply-marked limit in the course of education of the architect. This limit, as already said, lies naturally between the acquired complete technical education and the entering into an academy of plastic art.

It is the duty of the academy, or rather of the professors teaching in such an institution, to examine and to decide whether or not the student possesses the inborn faculties enumerated above.

It cannot be too strongly recommended to such professors to use the utmost severity in this examination, because the result of it will have a great influence upon the general artistic standard of the profession, and because it is only by this method that that class of pseudo-architects who in our days intrude on the profession, to the discredit of art as well as artists, can be made to disappear from the scene.

We take the liberty to advise those civilised States, the schools of which make it possible to every student who has gone through the technical studies to choose the profession of an architect, even if he has absolutely no artistic aptitude for it, to discontinue this practice.

We wish particularly to point out that for architects there can be only one school, viz., an academy of the plastic art; an academy for this reason, that art cannot be taught, and consequently cannot be admitted as a scientific subject in any course of studies, and because artistic education only consists in this. that the master shows to the art pupil the right way to perfection, and encourages him by his own activity to enter on this path.

It is, therefore, absolutely wrong for technical high schools and schools for artistic trades to admit in their plan of studies the tuition of architecture, because, owing to the students not being tested as to their aptitude for the profession, an absolutely inferior standard of architecture is created.

From what has been said so far it follows that the architect is an artist with a scientific education.

By the studies of technical matters successfully gone through by the pupil, and with the academical apprenticeship, the requirements for the architect are not yet, however, exhausted. The student is still lacking practical activity and the experience which results from it.

If the apprenticeship of the architect is an exceedingly long one, it will certainly be very considerably extended by the period he is acquiring practical knowledge in an architect's office.

In this section of the apprenticeship of an architect (his apprenticeship really ends only with his death), he stands once more at the parting of the ways in the progress of his education : that is to say, which way do his capacities lie? Circumstances, etc., lead him to the point either to accept the struggle for existence or to enter into the safe haven of a salaried position. Here his artistic capacity plays the main part, because the greater it is, the more easily will he be able to refuse the enticing bonds of a fixed position, unless it be a professorship.

The curriculum of education of the architect so far sketched is the normal one, but we would remark at once at this stage that it is certainly not the only one, and that there will be sufficiently numerous cases in which the inborn capacities of the architect, in other words his talents, are so great that a lack of scientific education is hardly of any importance.

This fact, as well as that other, that there is no limit of talent either in more or in less—further, the fact, which it is impossible to dispute, that the first architects in the world in a great many cases are not agreed on the question as to what constitutes an architect, give the certain proof that the title of architect cannot be protected by letters patent, and that a judgment of artistic qualities is possible only by the artists themselves, consequently by the grouping of the artists among themselves.

In the latter circumstance we find also the proof that municipal and State administrations are not even in a position to make the proper choice of an artist to fill an office.

Still another important factor comes into consideration for making such a choice. The architect appointed to an office will, while occupying it, certainly not play the leading part. His individuality, his taste, etc., must therefore subordinate themselves to the same qualities in his superior, or even of more than one superior. The works carried out under the supervision of the office would therefore not show the capacities, the taste, and individuality of the creating artist, but certainly the less valuable ones of his superiors, and as such superiors in most cases are laymen in questions of art, and often even in technical matters, it will be hardly necessary to give any more reasons why from such a combination no good can come.

It must also be mentioned that the artistic gifts of an artist oppressed by the yoke of office can never undergo the absolutely necessary development. These considerations prove sufficiently that a municipal or a State administration is never in a position to obtain the services of first-class artists as salaried officials.

But municipal and State administrations have certainly the sacred duty of cultivating the fine arts, which means with regard to architecture that the buildings erected by them should exercise the effect of models. But buildings of such a description can only be expected from great artists, and not from officials of an inferior artistic capacity.

For the same reasons the competence of the officials must only extend to the practical, technical, and economical, but never to the artistic control of buildings in the course of construction. If, finally, it is taken into consideration that, by the awakening which took construction. If, finally, it is taken into controversy raged everywhere, and that even to this day public opinion has hardly returned to calmness, and therefore is not in a position to judge with unbiassed artistic feeling works of art, such a large number of reasons has been put forward that the correct answer to Question I. becomes easy; it can only be this:—Important municipal and Government buildings can only be constructed by eminent artists, and not by salaried officials. The considerations alleged up to now will facilitate considerably other questions before the Congress.

M. Oscar Simon then read a paper on the same subject on behalf of the Central Society of Architecture of Belgium, the following being an abstract:—

The Central Society of Architecture of Belgium is of opinion that no advantage can result from the execution of public buildings by salaried officials (Surveyors, etc.),

Neither for the administration, which protects its agent and takes upon itself the civil responsibility;

Nor for the public, which pays and suffers from the imperfect arrangements of the buildings destined for its use, and the æsthetic feelings of which are too frequently hurt and painfully impressed by the permanent sight of buildings generally devoid of artistic character.

While we shall avoid entering upon personalities or trying to prejudice private interests, and having only in view the preponderance of the architectural art, and for the only aim a better future standing of the architects as a professional body, considering that these have a domain of art and its interests to defend, we hold that it is an abuse that certain officials (Surveyors) should offer to private parties on the look-out for authorisation by administrations services which are prohibited by the regulations, and which are a form of unlawful competition highly prejudicial to the independent architects existing only on the income from their professional art.

It is desirable that more energetic action should be taken by architects with a view to obtain legislative powers:—

1. By bringing into harmony with the modern requirements of life the rate of the out-of-date tariffs still enforced upon the architects.

(A juridic consecration should be given to this principle:—"To a superior talent higher fees should be allowed.")

2. By putting a stop to persons invading the architectural domain who do not exclusively exercise the profession of an architect.

3. By revising of the laws on buildings in those passages where the text, or the interpretation given to it, imposes on the architect obligations and responsibilities inconsistent with his mission as an artist and out of proportion to the fees which are allowed for them.

(Apply juridically to the architect and to the contractor the common-law principle:—"To a larger profit must correspond a more extended responsibility.")

4. The Central Society of Architecture of Belgium, in the conviction that even within a modest range the co-operation of the architect will still result in the work being carried out under advantageous conditions as to price, duration, and arrangement, without excluding an artistic character which it is always necessary to strive after, is of opinion that if it be essential that the execution of public buildings should be entrusted to private architects it is ardently to be desired that all the work, whatever its importance may be, of construction and arrangement of plan of buildings for the public use should be exclusively given to practitioners of the architectural art. In this there are considerations of corporative, economic, educational, and artistic interest, towards which the public officials must not remain indifferent. To our corporation are due the normal consecration of public teaching of art, a professional encouragement, and an official recognition of the rights and prerogatives legitimately given to our profession.

Moved by a feeling of professional solidarity, the Seventh International Congress of Architects meeting in London in 1906,

Wishing to affirm with all its power the claims and just aspirations of the architects, with a view to an improvement of the economic conditions of their existence,

Formulates the resolution:—

That in the future the administrations of States, departments or provinces, municipalities or communes, as well as the administrations of benevolent institutions which may be founded by the former, shall give instructions for professional architects to be appointed by way of public or limited competitions, or whose special capacities or notoriety shall be universally recognised, for the projects of works or buildings to be carried out within their jurisdiction;

That an absolute prohibition shall put an end to the interference of agents paid by the public administrations, that they shall obtain through private persons an authorisation which can only be granted by public authorities;

That within the limits of their influence in the Legislative Assemblies our representatives shall take the initiative to bring about the reform of the laws in force in such cases where the obligations and responsibilities imposed on the architect are incompatible with his mission as an artist and in disproportion to the emoluments attached thereto.

A paper by M. Gaston Trélat (Paris) was also read, in the author's absence at the Grafton Galleries, by M. Poupinel. The author's summary and conclusion were as follows:—

Recapitulating, the buildings we may have to erect or to rearrange answer the requirements of the moment or of the future. What is required is knowledge and experience.

Teaching is not sufficient to develop the necessary capacity. Something more is demanded than a cramming of characteristic facts acquired by instruction. The latter must be completed by a personal training in the profession. It is to be recommended that the latter be not started too late and that the simultaneity of the two operations be secured. The intellectual and the technical education combined generally carries with it a considerable widening of ideas. It may be infinite; not seldom even it lasts as long as life itself. There exists something like a stimulus to acquire new knowledge, the want of which is accentuated in intensity by the existence of personal ideas. But, above all, it is the true source of the original points of view as opposed to the knowledge acquired by study.

In the exercises offered by the workshop, the laboratory, or by that other vast workshop which is the nation, education is ever active and imparts a particular course to the mind. Then it is that the capacity for hypothesis and for the ideal asserts itself in matters of science and in matters of art. And is it not correct to say that they are a basis of operation for the study and the solution of the requirements of to-morrow; that they are even the only agents to prepare the realities in relation with the new wants? In the workshop as in the laboratory, where the master always respects, when occasion allows, the point of view which guides the student, this education is accomplished and completed. It takes unexpected and infinite shapes which the personal values alone are able to measure.

These considerations would thus lead us to express the wish that, in art as well as in science, the same method be put into operation from the intellectual point of view. The work in the laboratory and in the workshop would bring into evidence the variety of the points of view of the different minds. But, taking, of course, into account the vastness which science has reached at the present time, it is the individual and characteristic mode of action of the apprenticeship in the past that should lead us at the present.

In our times, after Claude Bernard, after Pasteur, to mention only two names borrowed from the nationality which I represent, art and science in the end get so near to each other that they appear to be very intimately related. In fact, from the circumstance of imaginative aptitudes which equally represent the ideal and hypothesis, it would seem that we should endeavour to make them one—at least in the aptitudes for initiative which open an unexplored field for new undertakings. The fact remains that art and science are in our days considerably near each other than they were in the past. They are two leading branches of human activity, each having no longer any right to remain indifferent towards the other.

The question of public buildings gives rise to a great many questions which interest our societies. This is one of the general features of the mission inherent to the architect. He must therefore keep in touch with the time and constantly interrogate it about the requirements it may manifest to him.

Science and art enable a selection to be made of remarkable solutions. The consequence is a knowledge and experience which the different modes signalled will call forth. It is useful to propagate their habit.

Mr G. Oakley Totten, jun., U.S.A., said he wanted to say a few words on the subject, because it was one of the few subjects of the Congress on which it was possible to see the material effect. A great many matters were to be discussed, but it would be impossible to press them to any final or definite conclusion. During the Congress of 1897 in Brussels he suggested, as one interested in the Government Office in Washington, a subject, quite informally, which was similar in its nature to the one under discussion. The Congress took the matter up seriously, and appointed a committee to consider it and to report on what they thought was the best method of obtaining designs for Government buildings, and they concluded that competition was the best method. It might be of interest to the members of the Congress to know in a general way what was being done in this matter in America. They were trying every possible method, in every possible combination. Their Government architecture was broadly divided into three classes: (1) That for the general Government, known as federal architecture, including the U.S. Capitol and its accessories, all P.O. buildings, the federal court buildings, custom houses, mints, the naval and military academies, army barracks, etc., buildings owned by and for the use of the general Government. (2nd Class) State buildings, which corresponded in a general way with the Federal Buildings, but were owned and controlled by the individual States; these included the State capitols and their accessories, county courts, hospitals, and asylums of various sorts, etc. (3) Municipal buildings—buildings owned by the municipalities, such as municipal office buildings, courts, schoolhouses, fire departments, hospitals, etc. He would speak first of city work. The municipal work in many of their large cities was in charge of a city architect. His work, however, was usually confined to school buildings and engine houses, and when larger municipal buildings were to be erected a competition was held for the selection of the architect. The same might be said to be true in regard to the architectural work done by the various States. In Washington they had no city architect. A few of the smaller buildings were designed in the Inspector of Buildings' office. The far larger part of the work was apportioned out to private architects of standing, usually by direct appointment, but in case of larger buildings by competition. Their largest general bureau, that under the Treasury Department, was known as the Supervising Architects' office. The work of this office was largely confined to the designing of post office buildings and federal courts and custom houses, but it also included quite a

variety of other buildings. The bureau employed a varying number of draughtsmen and clerks, from 125 to perhaps 250, depending on the work in hand. Congress this year had appropriated $39,000,000 for federal buildings, which would go through this office. It was in order to try to place this enormous amount of work in the hands of the private architects that the Tarsney Act was passed. In connection with this subject he begged to recall to those members present at the Brussels Congress in 1897 that he brought up the subject of "Best Methods of Obtaining Designs for Government Buildings," that the Congress appointed a special committee to consider the matter, and presented the following resolution, which was adopted by the Congress: "It is desirable that the construction of public buildings shall be confided to private architects, chosen by public or private competition, or otherwise, and that the architects superintend the erection of the works, but under the direction of the Government." This was after the passage of the Act, but before any work was given out under it. As a delegate from the Government, recommended by Mr. Tyman J. Gage, the Secretary of the Treasury, he had the honour of presenting the conclusions of the Congress of 1897 to him, and he was informed it helped to influence him to put into effect the Tarsney Act as proposed and urged by the American Institute of Architects. He would give but a *resumé* of the work done under this Act; a more detailed account, prepared by Mr. Brown, might be found in the May number of the "Brickbinder" for this year. The American Institute of Architects as far back as 1875 formulated a bill to regulate and improve the federal practice; modifications were made to this until Feb. 20th, 1893, when it became a law. In brief, it gave to the Secretary of the Treasury the power, at his discretion, to obtain designs for federal buildings by competition, stipulating that at least five competitors should be selected in each competition, and that the general supervision should be under the office of the Superintendent Architect. This Act was passed in 1893, but through some misunderstanding with Mr. Carlisle, then Secretary, it was not put into effect until after his successor, Mr. Tyman J. Gage, held the first competition in August, 1897. It was interesting to note that since that date twenty-two competitions had been held for building, varying in cost from $100,000 to $4,000,000. It was a great gratification to the profession at large in America that these competitions had always been fairly and unbiasedly judged, and that in perhaps every case the best scheme submitted was selected. In addition to his remarks he should like to request that a list of the regulations of the competitions, which he would not read, might be printed in the Proceedings of the Congress. Further, this Bill had had a salutory influence upon other departments of the Government and municipal authorities, and is bringing about better results and placing.

Professor V. Nagy, Hungary, said he was a Professor of Architecture, and he felt that unless a young architect had an oportunity of cultivating his talents after leaving school much of his ability was lost. If the young designer who entered an office had no opportunity of acquiring that knowledge of his art which was necessary to make a good architect, he would become a superior in time so far as position was concerned, but he would remain what he was so far as matters of art and construction were concerned. He would be fitted to do only the work of the office. He agreed with Herr Wagner's conclusion that important Government buildings should be the work of eminent architects only, and not of officials There was a danger of young architects entering a municipal office becoming indifferent to art. He agreed that officials should not make designs for public works.

Mr. F. E. P. Edwards, of Bradford, said it seemed to him that the title of the subject was just a little wrong. The title barred the way altogether to the possibilities of any good coming out of the work done by salaried officials as such. He took it that the real intention and the real ground upon which this subject was founded was the question of important municipal and public work being carried out by engineers and surveyors. He should like that to be made clear from the chair, *i.e.*, as to whether that was really the basis of the subject they were discussing or not. He might say at once that he was a salaried official, but before that he hoped he was an architect, and with regard to work which was done by official architects in this country as such, he ventured to think that a number of instances could be quoted, without being personal in the matter, of most excellent work having been done by official architects. In north, east, south, and west in this country, and in the metropolis itself, there was excellent work being done by official architects, and therefore he ventured to ask that the subject be put upon a little clearer basis. They all knew that the style of work and the style of design and plan which was carried out by the municipal engineer and surveyor with a staff of two or three architectural draughtsmen was not what was aimed at at all. They aimed at something very different. He had written to the secretary of the Institute before, asking that when this matter was discussed at the Institute that this should be clearly differentiated. He ventured to go a little further and to say that he thought that at the bottom of the whole thing was the fear that their living was being taken away from them. If the experience of a large body like the Architectural Department of the London County Council was that their work could be carried out at less than by the usual commission paid to an architect, that was a strong inducement to the employer when making such an appointment. He thought himself that the whole evil arose from the fact that there were too many young fellows taken into architects' offices as premiumed pupils, who, after two or three or five years, were turned loose and had to get their living somehow. Up North there were so many of these young fellows about that private firms who had architectural work to be done, and who did not care about the artistic side of such work, saw that their work—mills, boiler-houses, etc.—could be done cheaper by employing these young fellows. He knew numerous instances in Yorkshire where private firms employed architects on the staff—he did not know what salaries they paid; he presumed it was a living salary, and it might be a good salary. All this proceeded from the fact that there were too many pupils, and the parents of young fellows did not properly realise the responsibility which attached to them in putting their sons into a profession which they had not the slightest aptitude for. It was too late to reconsider the matter when the young fellow was twenty-two or twenty-three, and the result was that there were a good many architects—good, bad, and indifferent—and they had to make a living. He put that forward with all deference for their consideration, for he thought that the question they were discussing was intimately bound up with that of the present system of pupilage.

Mr. A. W. Weissman, Holland, said he was once an official architect, but now he was a private architect, and he did not know if it made much difference whether a man was an official or a private architect. It depended on the gifts a man had. If a private architect had no gifts, and if the official architect had, then he should prefer the official architect. There were architects in Holland who did not put a line on paper; their young pupils did that, and he hoped such practices did not take place in England. Perhaps they did, but in any case they did elsewhere. The thing was, if a man had talent it made no difference whether he was an official or a private architect. They could not say in general that no official architect should make great and important buildings; it all depended on whether the man had the gifts to make them.

Mr. A. B. Plummer, Newcastle-on-Tyne, said that as hon. secretary of an allied society to the Institute he might say that they in the provinces at all events in England felt that the subject was of the utmost importance. While he agreed with the last speaker that he would prefer an official architect with ability to a non-official architect without ability, he would still more prefer a non-official with ability to an official with ability. In many of our large centres we had non-official architects with ability who did not have much opportunity of carrying out municipal work. He did not know whether the discussion was limited to important municipal buildings, but in the provinces it seemed to them that official architects and engineers and surveyors, who had no one to criticise or supervise, and who took private practice, could practically pass their own work; whereas the practising architect was criticised and had his work rejected by the gentlemen in question. In the provinces it was a temptation to people wanting to employ an architect to go to the official architect to do their work when they knew that that official would be able to pass that work. If the Congress could do something to make it illegal for salaried officials to practise as private architects it would have done good. The matter required serious consideration. They did not object to an able architect acting as a city architect, say, but they objected to the salaried official competing, in his private capacity, with private practitioners. That was what they complained of. As to it being cheaper for a large municipality or Government to carry out work by a big staff, that might be so in some cases, but in the provinces it was not so. Say an architect carried out a council school; when the work was completed the expense to the municipality ceased; whereas a municipality keeping up a staff had to keep that staff going when the work was finished, and whether there was work or not. Often a practising architect was an expert in some municipal work and the municipal architect was not an expert in that work, and it was to the interest of the ratepayers that the various corporations and other public bodies should be able to obtain the best advice. We knew there were men who had made a special study of special work, and to have such work put in the hands of salaried officials because they were officials could not be to the advantage of the ratepayers. He hoped the question would be pressed forward. In the provinces the practising architect was suffering severely, and increasingly severely, in the matter.

Mr. G. H. Fellowes Prynne said the subject was one of the most important which could be brought before the Congress. It was a subject which touched every practising architect in these days, when there were so many public bodies in England and abroad. In England we suffered from the disadvantage of not having a Minister of Fine Arts, nor had we any sort of Jury of Fine Arts, and therefore in England perhaps more than on the Continent—and he trusted more than in the United States—we suffered from officialism. The matter had been so clearly dealt with in the three papers that it did not need much debating to see how detrimental the present system was. M. Oscar Simon summed up the whole matter when he said that there were two good reasons against the giving of important municipal architectural work to salaried officials, *i.e.*, that it was neither for the good of the administration or for the good of the public. Those two reasons were very distinct, and they were absolutely true. There was a large amount of work which was good, and must be good, coming as it did from good men who had been appointed to official positions. At the same time, as Mr. Plummer said, these officials not only acted in their official capacity, but as to their own work they had a large staff of clerks who were paid by the municipality by whom they were employed; and, as had been said, a large amount of the work turned out was done by salaried clerks and not by the architects themselves. An official was too often taken up by his official duties. Think of the enormous amount of official work which had to be got through before the official architect could touch the artistic side of the work of architecture! And think of the amount of time one gave to one's designs when interested in even a small work, let alone a work of national importance! One's whole time was taken up in throwing oneself into the design, and this was utterly inconsistent with the carrying out of official duties of an important and complex character in addition. He would go even further. In large corporations in England, and he supposed elsewhere—take such a body as the Ecclesiastical Commissioners, for instance—where a man had the power of criticising and altering other men's plans, or even of throwing them aside (often rightly so and with great advantage), it was,

however, a dangerous thing to give this power where the official had the power also of taking private work, as well as the work connected with the body with which he was associated. It became a danger to the whole profession generally that it should be accepted as the right thing for salaried officials by right of their position to take up large public works of this character. Beyond that, it was surely bad for the art that the designs of an artist of any high instinct at all must be pulled about and altered by a number of men who, however willing to save the public purse, were not the least authorities on art; and it could not be denied that officials who, however good their designs might be in the first place, were terribly handicapped by the criticisms of this, that, and the other perfectly ignorant man, as to the artistic ideas in that design. He therefore hoped that the Congress or that meeting would not end without passing some definite resolution—a resolution put forward by that International Congress of Architects, and sent to the various Governments, expressing the opinion of the Congress. But, as had been said, it was all very well to pass such resolutions; they must go a little further and let it be known that these were the honest opinions of men working for the highest end, *i.e.*, the advancement of the art of their country.

Mr. Maurice B. Adams said, as to what was intended by the words "salaried officials," he presumed that the majority of architects of the country would realise that the salaried officials aimed at were the engineers and road surveyors employed throughout the country by county councils and smaller bodies. If there were a fully qualified architect at the head of affairs of a big bureau or big institution, such as must be associated with a large county council, and if these public bodies found it was cheaper on behalf of the ratepayers to have such a bureau, it was useless for practising architects to protest against such an arrangement, except to point out in this regard to large bodies that it was scarcely possible, however great a man's artistic ability when he originally accepted such chief official position, for him to have retained that ability or have developed it; it must be knocked out of him by the various clerical and administrative detail work of such an office. There was so much clerical work to do, and the original power as an architect or artist must necessarily be very much curtailed and injured by the process. Even if they agreed to the general tenor of what might be urged to the effect that the salaried architect was, or might be still, an artist it was scarcely possible to believe that he could produce such work as the man who was engaged as an independent architect, and who had produced works which would justify a Government or any other authority in inviting him to take part in a limited competition, or commission him to do the work as it was done in America. What they were desiring to impress upon the public was that it was not economical or good in any sense or form—quite apart from their individual interests as architects—for the ratepayers as well as architects that men trained as engineers and road surveyors were—in fact, by virtue of the very power they had to carry out those duties—to do the strictly architectural work they were constantly called upon to do. He thought that the Institute of Architects and the Congress should in the most unqualified way say that in the interests of architecture as a high art and in the interests of the ratepayers it was a bad thing that they should go on in this hugger-mugger way. The most expensive buildings were thus often erected by men for whom otherwise and personally one had the greatest regard. As architects they were not architects at all; such men employed, and were obliged to employ, young fellows who had a certain amount of artistic ability, but who had no practical capacity, and had failed to get into practice themselves. They were artistic ne'er-do-wells, who were thus employed from month to month, being kept on a long time at great public expense until all the details of payment, etc., were cleared up, because the engineer or the surveyor did not personally know anything about the matters in dispute. The extent of the expense was never known; it was impossible to know what the office and establishment charges were. These young fellows were kept on until the whole work was cleared up, so that they could consult with the quantity surveyors as to extras and so on, whereas when a private architect was employed he was always available and the expense was curtailed. This matter was as a matter of fact mixed up with municipal trading; some public bodies could manage large establishments, labour bureaux, etc., but the rank and file could not; they kept on large staffs and actually created work at the expense of the ratepayers in order to keep the works department going. They must not, in considering the question, forget that there was a general tendency at the present time—at all events in England, he did not know how it was abroad—for municipalities to take on work which could more properly be done by private enterprise. He suggested that the meeting should clear up a little more definitely what they meant by "salaried officials," but he entirely sympathised with what Mr. Weissman said—if they had a good man, wherever you found him his personality would show itself. But he would go further and say that an architect in an official position with a personality was obliged to concern himself with some work which did not rightly belong to an architect as such, and that work would curtail his artistic work and hamper him to a considerable degree.

M. Jules de Berczik, Budapest, said that there seemed to be a hostile tendency towards architects occupying official positions. It would be undesirable if, in discussing the question, they were so unfortunate as to give currency to a view calculated to depreciate the general artistic ability and personal fitness of architects occupying official positions. It was well known that the artistic training of architects occupying official positions was the same as that of architects in private practice, and, seeing, as had been pointed out, that artistic ability was a purely personal gift, it would therefore be scarcely justifiable to deny all Government and municipal architects the right to take part as a private venture in artistic works. Nor, indeed, was this at all necessary in order to attain the object which he believed they all had in view. For it was not solely on administrative and economic grounds that the construction of important buildings by Government or municipal departments was to be objected to. It was eminently to the educational interest of the Government or municipality that monumental building should be as perfect as possible from an artistic standpoint, and should give impression to the educational progress as well as to the artistic education of the country. This object could, however, only be attained if all the best ability of the country was permitted to co-operate in the construction of these buildings. From this open competition no architect possessing formal and personal fitness should be excluded. He would therefore (in order to eliminate all personal considerations from the question) venture to propose that the Congress should pass the following resolution, *i.e.*, that "Important municipal and Government buildings should not be constructed by municipal or State administration."

Mr. John Slater said that Mr. Edwards wished the particular wording of the question to be altered, but it was impossible, he was afraid, to do so, for Herr Wagner had submitted it as printed. But, as had been said, it was the principle they were fighting for, and it would be absurd to deny that in some cases, perhaps in many cases, the municipal architect was a man of knowledge and training and competent to carry out architectural work; but it was folly, and Herr Wagner had brought that out very clearly in his paper, to think that under ordinary circumstances an official architect could possibly have the time at his disposal for dealing with large municipal buildings which required an amount of thought and consideration in planning and arranging which his other duties made it impossible for him to give; and it was with that view that they were promulgating this question now, and he certainly agreed with Mr. Prynne when he said that they ought to endeavour to get an actual resolution passed and carried, which might have weight not only in this country but in all the countries represented at the Congress. He called upon M. Poupinel to propose and Mr. Plummer to second such a resolution.

M. Poupinel then proposed the following resolution:—"That, in the future, in the interests of the administrations and the public, and in the higher interests of the art of architecture, public bodies, whether Government, provincial, or municipal, should entrust architectural works only to professional architects who may have special aptitude for the particular work or may have a renown which is incontestable, and that they should put an end to the employment of their own salaried officials in private works."

Mr. Totten said that the subject under discussion was not put forward at the Brussels Congress, in 1897, as an official subject, but he presented it personally on behalf of his Government, and the conclusions adopted at that Congress, it seemed to him, were quite applicable to, and exactly followed, the lines of Herr Wagner's resolutions, and in accordance with what they should adopt that day. He suggested that the resolution adopted at the Congress of 1897 be accepted as the sense of this meeting. The resolution was that it was desirable that the erection of public buildings should be confided to private architects chosen by public or private competition or otherwise, and that the architects superintending the erection of the work shall be under the direction of the Government.

Mr. Slater asked if Mr. Totten could accept M. Poupinel's resolution.

Mr. Totten said not altogether. The two might be combined.

Mr. Plummer seconded M. Poupinel's resolution. He said they were agreed as to the character of the resolution.

Mr. Adams suggested that the last line would be better as an expression of opinion. The part as to officials engaging in private practice would come rather badly in connexion with the previous part. They were all agreed about it, but he thought it would be better put separately.

Mr. W. E. Riley said they were not all agreed about it at all. They wanted to hear what it meant.

A speaker said that in that case it would be better to put the latter part separately. It would only come as an expression of opinion.

Several other gentlemen also expressed similar opinions, one remarking that the first part of the resolution would be carried unanimously and the second part not so unanimously.

M. Poupinel agreed to separate the resolution as proposed, ending the first resolution at the word "incontestable."

Mr. Prynne said the resolution was not quite happy yet. He thought they might accept as an addition, "by competition or otherwise," for they did not want to shut out the genius who might not be known and men who were really clever, otherwise men would not come forward at all.

Mr. Riley said he moved that the words, "by qualified architects," be inserted.

Herr Bodo Ebhardt (Berlin) said that Germans had had long wars on this subject, and it was found impossible to say that an official architect could not have genius because he was an official, and they had agreed that a competition should be the way to find the man to plan a work, and that all big works should be submitted to architects generally.

Mr. Riley said that he would be disposed to accept that if it was the sense of the meeting, but he should like it made quite plain that officials should not be excluded. He did not know what the official had done to be treated in the way proposed. The official was what he was by circumstances. He was there in that way as was any architect in the same circumstances in the position he occupied. He begged the Congress not to come irrationally to the conclusion that because a man was an official that he should be excluded from the proper discharge of his work. He moved that the resolution should not exclude the qualified official.

Mr. Leverton seconded.

M. Poupinel said that his resolution did not exclude the official if Mr. Prynne's addition were agreed to.

Mr. Riley said that if that were so he would accept it.

Mr. Slater then read the resolution again, with Mr. Prynne's addition, *i.e.*, "by competition or otherwise."

Mr. Riley said he had no complaint with that.

Mr. Totten said that they had lost sight of the main question, which was the method of executing public works of architecture. One side had presented that it might be done by salaried officials quite as well as by private architects, and the other side had maintained that public officials were occupied too much by other duties to have the time to give to designing works of art. According to what was now proposed, anyone could do these works so long as he had some reputation.

Mr. Riley: Only architects.

Mr. Totten: The general broad question of what was the best way for the art of having work executed—was it by entrusting it to men who occupied positions as officials or to men who had some authority in art? He did not think the resolution covered it, and he did not think the question should be settled by a small meeting, such as that had become. He moved that the matter be referred to a small committee to formulate the resolution, and that it be dealt with later on.

Mr. Riley asked if the motion was in order?

Mr. Slater said it was in order, but he did not see how the motion could be given effect to for want of time.

Mr. Totten said the matter could be disposed of in half an hour the following morning if the proposed committee dealt with the form of resolution.

Mr. Prynne said that if they had to give a vote then, the words, "salaried officials," ought to be included in the resolution.

Mr. E. Harper moved that the discussion be adjourned until the following morning at 9.15.

Mr. Totten seconded.

Mr. Fawcett said that if they adjourned they would not get half the present audience, who had heard the arguments.

Mr. Slater: Quite true, but half the audience have left who have heard.

The motion to adjourn was then put and lost.

Mr. Slater then put the original resolution, as amended, *i.e.*, "That, in the future, in the interests of the administrations and the public, and in the higher interests of the art of architecture, public bodies, whether Government, provincial, or municipal, should entrust works of architecture only to qualified professional architects either by competition or otherwise."

The motion was agreed to, and the proceedings terminated.

Steel and Reinforced Concrete.

This subject was considered at the meeting held at the Grafton Galleries under the chairmanship of Mr. Frank Miles Day (President of the American Institute).

The Chairman said that the subject for discussion was one of life interest. The subject of reinforced concrete was one which appealed to them from many points of view, whether it be from the economic view, the purely constructional view, or the yet more difficult of the appropriate expression of the material in the design. He was sure they had so many able speakers who would treat the subject from so many points of view that it would indeed be curious if they did not carry away with them much light upon the subject.

Mr. Searles-Wood read the report of the Joint Reinforced Concrete Committee as follows:—

The great and increasing use of reinforced concrete in buildings and other structures, and the need of having some authoritative pronouncement on the proper conditions of its use, have led the Royal Institute of British Architects, with the co-operation of other bodies, to appoint a Committee to inquire into the subject.

The members of the Committee are as follows:—

Nominated by the Royal Institute of British Architects:—Sir Henry Tanner, H.M. Office of Works; Professor W. C. Unwin, LL.D., F.R.S.; Charles F. Marsh, M.Inst.C.E.; A. T. Walmisley, M.Inst.C.E.; Max Clarke, F.R.I.B.A.; William Dunn, F.R.I.B.A.; H. D. Searles-Wood, F.R.I.B.A.; Colonel F. Winn, late R.E.

Nominated by the War Office:—Colonel C. B. Mayne, R.E., Assistant Director of Fortifications and Works, War Office; Major E. M. Paul, R.E., Assoc.Inst.C.E., Instructor in Construction, School of Military Engineering, Chatham.

Nominated by the Incorporated Associations of Municipal and County Engineers:—A. E. Collins, M.Inst.C.E.; S. S. Platt, M.Inst.C.E.

Nominated by the District Surveyors' Association:—E. Dru Drury, F.R.I.B.A.; T. H. Watson, F.R.I.B.A.

Nominated by the Institute of Builders:—Benjamin I. Greenwood; Frank May, J.P.

The Committee has appointed Sir Henry Tanner as Chairman, Professor Unwin and Colonel Mayne as Vice-Chairmen, and Mr. H. D. Searles-Wood as Hon. Secretary.

It has appeared desirable to the Royal Institute that some statement be made before the International Congress of Architects in London as to the general scope and aim of the Committee, and the following outline is made with their approval:—

The aim of the Committee's deliberations is to prepare a report, stating their recommendations and conclusions as to:

1. What drawings and details should be prepared before work is commenced.
2. The nature of the materials which may be employed, and the standards to which these should comply; *i.e.*:—
   (a) The metal in reinforcement.
   (b) The matrix.
   (c) The sand.
   (d) The gravel, stone, clinker, or other aggregate.
   (e) Water.
3. What are the proportions for concrete to be used in different cases.
4. How the ingredients for concrete are to be mixed and deposited on the work.
5. The distances to be allowed between the reinforcing bars and what covering of concrete is necessary.
6. What precautions are necessary in the design and erection of centring and false work, and how long the whole or portions of centring and false work should remain in position.
7. The rules which should be used in determining the dimensions of the several parts necessary for security, and what safe stresses should be allowed.
8. The supervision necessary and the special matters to which it should be directed.
9. The fire-resisting properties of reinforced concrete.
10. Its adaptability for structures where resistance to liquid pressure is essential, and what special precautions may be advisable under these conditions.
11. What are the necessary conditions for its permanence; resistance to rusting of metal, disintegration of concrete or effects of vibration.
12. The testing of the materials employed and of the finished structures.
13. What provisions are desirable in Building Laws or Government regulations relating to buildings and other structures, so far as these affect the use of reinforced concrete.

The Committee having been recently constituted, and only two meetings having been held, no conclusions have been arrived at, and members of the Congress are invited to send communications, either the results of experiments or other information or suggestions that may be of use.

Mr. E. P. Goodrich followed with his paper, of which the following is an abstract:

In choosing the subject of "Reinforced Concrete and its Relation to Fire-Protection," the writer had in mind the dual conditions necessary to the greatest immunity from fire in large building constructions, particularly where such has varied types of occupancy, together with correspondingly different manufacturing fire hazards.

The requisites are, first, the employment of the most incombustible materials and the assembling of these elements in such manner as will most effectively limit the spread of fire; secondly, the equipment of the building with such protective and extinguishing apparatus as a wide experience has determined most effective. Either of these essentials alone will accomplish a large measure of results, but to secure a maximum the combination is necessary.

An exemplification of such a combination is the tenant factory community being developed by the Bush Terminal Company of Brooklyn, N.Y., U.S.A., for which reinforced concrete has been adopted as the structural part of all buildings. These factories were especially designed to take advantage of all insurance regulations, and thus secure the minimum insurance rates on buildings and contents.

Associations of insurance companies in the United States have had the effect of standdardising requirements. All the most important points thus developed were carefully considered in the design of the Bush Factories, which thus were provided with:—Special fire-walls, special stair and elevator shafts, waterproof floors, automatic fire-doors, a complete sprinkler equipment, windows of wire-glass in metal frames, etc.

The reinforced concrete design was prepared with special care as to the fire-resisting qualities of his (Mr. Goodrich's) system of of reinforcement was devised, which proved effective and economical, not liable to derangement during construction, and especially advantageous because allowing of the use of special fire-resisting materials at points of greatest danger. The columns, even though built of concrete, were fire-proofed with cinder concrete-shells, which served at the same time as a vehicle for the steel reinforcement and as a mould for the construction of the main body of the column.

The building now completed enjoys the lowest rate of fire insurance, both as to structure and contents, accorded any similar risk.

M. Rey (Paris) asked two questions:—1. To what temperature have the experiments been carried as to the fireproof qualities of his (Mr. Goodrich's) system of ferro-concrete? 2. How far can this system be applied to the economical construction of big artisans' dwellings?

The time limit prevented M. Cloquet in the first instance from finishing his paper, but he subsequently read the concluding pages, which answered the questions put him as to temperature and decoration. In a few impromptu remarks, he recommended that external walls, elevations, etc., should be built double of two thicknesses of ferro-concrete. Hollow walls would give an increase of strength, and the enclosed air, while giving protection from the heat of summer and the cold of winter, was also of help as a non-conductor in case of fire. As regards decoration, no very satisfactory solution had, as yet, been found. Architecture and its decorative methods have been evolved from a reasoned use of stone, etc, though, at the present day, stone is frequently used in the most insane manner, and methods of engineering construction are often adopted by architects proper. We cannot graft old architectural forms on to ferro-concrete; all such added decoration is bad. Old ideas must give way to new, and we anxiously await this new development. What course will it take? Ceramic, mosaic, painting, or some plastic form? So far, our ideas on the subject are negative, rather than positive. The one thing certain is that all the hitherto accepted architectural forms, based on the old methods of construction, will have to be banished from ferro-concrete if the new method is to occupy a dignified position as architecture, and is not to remain mere construction with its decoration applied. And again he reiterated: "Architectural forms must certainly not be applied as mere surface decoration." M. Augustin Rey (of Paris), as architect to the "Fondation Rothschild," spoke with authority of the help that ferro-concrete will be in solving the vexed question of the housing of the poor. He finds that ferro-concrete is a very economical method of constructing artisans' dwellings of three to five stories in height. The question of overcrowding is one of extreme and growing importance, and, in view of this fact, it is to be regretted that the Chairman of the meeting was unable to ask M. Rey to read the paper he had written on the subject. M. Rey considers that one room to be occupied by two persons should be the basis of calculation. At this estimate no less than 24 per cent. of the population of Paris are ill-housed in 41 per cent. of overcrowded dwellings; while in the whole of France the overcrowded population in cities amounts to 4,000,000 souls. This overcrowding constitutes a serious menace to the public health. If these figures cause M. Rey such concern, what would he say to our English statistics?

We hope that the economical use of ferro-concrete, as demonstrated by M. Rey, may be brought to the notice of those who are endeavouring to solve the burning question of the housing of the working classes.

Mr. E. O. Sachs asked to be allowed to make a few remarks on the very valuable paper read. In the first place, he wished to thank Mr. Goodrich for coming over and telling them about one of the biggest buildings in reinforced concrete erected in the United States recently. In the course of the paper the word cinder had been used constantly, and he would like to know the definition of cinder in the United States. Did it come within the term coke breeze, as used in this country, or was it more used in the definition of clinker.

Mr. Goodrich said that clinker was the more synonymous word.

Mr. Sachs said that reference had been made to the fact that the fire insurance companies' regulations specified the aggregate which had to be used. They heard constantly of rock and stone aggregates, but they had had experiments showing that clinker aggregates and slag aggregates seemed to have a far higher resistance than these aggregates.

Mr. Goodrich said that the experiments in the United States, as in this country, showed that clinker and coke breeze had a higher resisting point, but the insurance companies thought the rock and stone was equivalent.

Mr. Sachs asked where the aggregate was defined. The fire-office regulations in this country required, he believed, that every part of the aggregate should pass a 1-in. mesh. That was of the utmost importance, as they found in tests and in actual cases of fire that aggregates split and the larger pieces fell off, with the result that the metal became red-hot and the beams deflected.

Mr. Goodrich said the rules did not define the aggregate except that it should be able to pass between the bars, and in no case be larger than 2½ in.

Mr. Sachs said the object of primary importance so far as fire resistance was concerned was the protection of all metal-work. The metal-work should be protected by a certain number of inches. The number of inches could not be exactly defined by the present state of science, but it would certainly be 2 in. or more. He would say, however, that it was of equal importance on this question of the thickness of the protecting covering that the aggregate should be defined. Further, as safeguards for the actual construction and the additional protection, which could be obtained at practically no expense, was the rounding off of external angles. He offered those three points as being most important ones in relation to fire protection and reinforced concrete.

Mr. Max Clarke said he would like to ask the reader of the paper what was the definition of clinker. Mr. Goodrich had told them that this was one of the aggregates which applied, and that cinder was another, but he wanted to get a hard-and-fast definition of clinker. He thought the material to form the aggregate of concrete was one of the subjects which was going to be considered by the Joint Committee on Reinforced Concrete, and, to him, it appeared that very serious investigation on the point was needed, and it could not be too thorough, as it was now fairly well known, from the experiments conducted by the British Fire Prevention Committee, that light and porous materials were generally the best in case of the outbreak of fire, but not the most satisfactory for strength-giving in construction. For the latter purpose most people would admit that gravel would be used from choice, but it was almost the worst from a fire point of view. Whether some happy combination could be thought of remained to be evolved from the deliberations of those who had the matter in hand, and he would ask the speaker whether such combinations had been worked out at all in America. The Fire Offices Committee in London excepted coke breeze from their list of materials for the aggregate of reinforced concrete, and he understood the regulations of New York were on the same lines. It was not used as one of the materials, but cinder was. He would like the reader of the paper to give a hard-and-fast definition as to what coke breeze was, and also as to what cinder was contrasted with clinker. With regard to coke breeze, he knew the Fire Offices Committee objected to it on account of its having a small proportion of unburned coal in it, but, as a matter of fact, they had discovered from experience that unburned coal in the concrete, subjected to 1,800 deg. of heat for three hours, came out just as it was put in, and if any gentleman liked he was at liberty to see the specimens.

Mr. Goodrich said the definitions differed. They tried to exclude materials which were poor. Some engineers allowed soft bituminous coal ash or clinker to be used. Others required the use only of anthracite material. His personal opinion was that anthracite only should be used. In some cases he had required screening and washing of materials so as to exclude the fine material which would be nothing more than sand of poor quality, and which would serve to bring the cement into a hard material which would take the place, primarily, of gravel except that it was more porous. It was almost impossible to exclude unburned coal, and in some cases where tests had been made the unburned coal was 50 per cent. of the clinker, and this was found to be very little affected, except on the surface which was close to the fire. The use of 2 in. or 3 in. of covering was well where it could be done, but it seemed unnecessary in many cases, especially with small material. In any case, the use of a certain amount of unburned coal was almost necessary, and, in all probability, was not detrimental. Whenever the unit system was employed, if it was thought worth while, the lower portion of the aggregate could be made them." They all looked to the time sion part on the top could be made of rock aggregate. This had actually been used in some cases, and he himself had made such a beam before Capt. Sewell brought the matter in a paper before the American Society of Engineers.

M. Augustin Rey asked what experiments had been made to show up to what temperature reinforced concrete was fire-resisting, and he also asked if Mr. Goodrich's system could be employed for industrial buildings several stories in height.

Mr. G. B. Post said it might be of interest to the gentlemen present to know that those in large practice as architects in the United States used ferro-concrete with considerable trepidation, from the fact that there were no established constants which could be employed in computing the strains. They did not know, under different conditions even, what the position of the neutral axis of the beams should be under different loadings. The material itself must be most carefully mixed, and all the ingredients must be perfect, as it was subject to failure. In fact, their opinion of the material was very much like that of the distinguished Mr. Weller with regard to veal pies—they were "werry good things when you knowd the lady as made them." They all looked to the time when they would know more with regard to the subject. Those who were putting up work with enormous rapidity, and who were required constantly to build eight, ten, twelve, or twenty story buildings in eleven months, were looking forward to the time when they would have more scientific data which would enable them to use the material in a more scientific and less amateurish way. His object in speaking was to say that he had had the honour to be appointed, with Mr. Eames, by the President of the United States a member of an Advisory Board which had been instructed to make extensive tests of all building materials, as well as coal and fuel and various things of that kind. He had urged the Commission that very careful experiments should be made with regard to reinforced concrete, so that the some error would not be found in the calculations with regard to reinforced concrete which were found in the constants for wood which were determined from experiments and tests carried out on small sections. Fortunately for their country the errors in the loads required by the building laws almost exactly compensated for the deficiency in the constants in the building materials. He did not know whether Congress had made the necessary appropriation for the continuance of those experiments in the last session or not, but if the appropriation had been made he believed before the next Congress assembled that America would be able to furnish them with valuable information with regard to the whole subject. There was one other point which was to have most careful and thorough investigation, and that was the question as to whether cement was or not an efficient protection of steel from corrosion. He had seen steel in small sections in the form of expanded metal used in tabular floor construction which was exposed twelve months to the atmosphere, and which was absolutely destroyed by corrosion. This, of course, might have been an exceptional defect due to some curious ignates which could not be determined either by physical or chemical tests, but it was necessary for the safe use of the material that they should know how to protect steel. Another matter not mentioned in the regulations of the Committee which had been brought before them that morning, and which he thought should receive attention, was the danger of electrolysis from the huge free current of electricity in all their great cities.

Mr. Goodrich said the question asked was, "To what temperature have the experiments as to the fireproof qualities been pursued?" The actual temperatures found by the use of the melting point of building materials varied from 1,400 deg. to 2,000 deg. In the Baltimore fire the temperature varied from 1,400 deg. to slightly over 2,000 deg. It was between these limits the tests had been made. He believed that the United States Building Department required that a temperature of 1,800 deg. should be maintained for eight hours. In some cases the temperature was raised and had been maintained at over 2,000 deg., but the usual temperature was from 1,700 deg. to 1,800 deg. Fahr. for several hours. Then the question was asked whether the methods of construction referred to were applied to buildings several stories high, such as working-class dwellings, and so on, and he might say that he had at the present time an office building of eleven stories high, and also several dwellings from three to six stories high, and in San Francisco nearly $1,000,000 worth of work of buildings from one to six stories high.

Mr. A. W. Ruddle (Peterborough) said he had been rather troubled by the statements of the speakers from America. He did not know whether he had made a mistake, but he understood Mr. Goodrich to say that it was unnecessary to use two rods in the reinforcing of steel work.

Mr. Goodrich: Under certain conditions.

Mr. Ruddle said he took it that there was no necessity to obtain any greater external area of the steel, because he understood that the concrete adhered to the steel work, and that the reinforcing in the members which were to give additional strength against tensile strains was given by the adhesion of the concrete to the steel. However, another speaker had raised a point as to whether cement was an adequate protection of steel, and if they coated their steel with any paint they lost at once the adhesion of the concrete to the steel which was to be of so much assistance.

The following papers were then read on the subject:—

Professor Louis Cloquet, on behalf of the Central Society of Architecture of Belgium, read a paper, the following being an abstract:—

The old style edifice was characterised by the separation between two distinct parts, the walls and the gable. There is a lack of solidarity between the two. At the point where the trusses of the frame rest upon the walls there is something like an articulation. The introduction of the metallic frames has not at once remedied this characteristic defect of buildings formed of stone walls and gables of wood. For a long time it was customary to combine trusses of iron similar to the wooden trusses. The solution of the problem of the large halls only made a decisive step in advance when the centred trusses were introduced, which have their starting point on the ground, like the trusses of the Dion pattern. From that moment the solidarity between the vertical and the inclined parts was secured. However, it is only the trusses which cannot be deformed. The solidarity between the vertical and the inclined parts is not realised in the inclosing surfaces. There is lack of homogeneousness between the two parts of the building—that is to say,

its skeleton or frame and its wall. Logic claims a more radical solution, which would consist in establishing solidarity not only between the uprights and the trusses, but rather between the wall and the roof. This is what the use of reinforced concrete enables us to realise. The side wall may even disappear or be made one with the vault. The whole will show almost uninterrupted surfaces on the outside as well as on the inside, with the absence of the encumbering internal protrudings of the frames. The new arrangement has, therefore, as a result to save the trusses, and only to maintain a surrounding wall which supports itself without any assistance. Now experience has shown that buildings conceived on this plan do not cost more than those carried out in thick stone walls with metallic gables, and that they are solid.

If it is question of a building with stories, the floor of reinforced concrete takes with advantage the place of the old systems. The most characteristic consequence of the use of reinforced concrete is the suppression of the roof, as the uppermost ceiling can be used as a cover and constitute an inhabitable terrace. This kind of construction lends itself, moreover, to the boldest rakes or overhanging structures.

This system, if applied in a rational manner, is able to bring a change into the architectural forms. It simplifies the forms, it causes the cumbersome complexities of the frames and floorings to disappear, it simply carries out all the surrounding or separating surfaces. It makes disappear every distinction between the wall and the roof. It introduces an architecture consisting of so elastic surrounding walls that these can be given any dimensions required, according to the space it is useful to inclose. The habitations will take the shapes of parallelopipedics terminated by terraces, and the large buildings with curved vaults with visible estrades. We must be prepared to see sculptures and moulded relief work disappear and coloured ornaments to prevail. A radical change in the internal and external forms of the buildings will be the consequence of the substitution of a concrete, solidary, homogeneous structure for our former architectonic organism. All the forms proper for a combination of marked-out stones and covered over with plaster, which will henceforth no longer be used, would here be devoid of expression and æsthetic value. They must be given up and other methods must be found.

We have in mind three kinds of form: those of convenience, those of structure, and those of expression.

The forms of convenience, by which the building receives its complete usefulness and a character in harmony with its destination, satisfies the mind without causing pleasure to the eye. Those forms of convenience which are, if not the most pleasing, at least the most excellent, can be carried out to perfection by making use of the processes, so eminently practical, of reinforced concrete.

The forms of expression are those by which the architect and his assistants put their imagination and their soul into the building, in order to impart to it the eloquence of a pleasant aspect. The ideal is that they shall form an integral and inseparable part of the structures. In the buildings constructed of reinforced concrete there is little scope for the artist's talent, especially the sculptor's. There remains hardly anything except the superficial decoration by painting and some polychromic, ceramic, or other adornments, but for the artists in colour a vast field is opened for their creations.

The forms of structure, either real or fictitious, are the principal ornament of the buildings produced by the old methods. They are those organic forms which give life to the aspect of buildings with walls of marked-out stones.

In the old-fashioned conception a building is to be compared with a living organism where we can distinguish a skeleton, various members, and a sort of muscular system. Reinforced concrete does not afford these elements of interest and charm; it leaves the impression that the work has been carried out in too docile a material, on which the sacred labour of the workman and his traditional processes have not left the traces of the noble struggle between the artisan and matter. We do not find the same beauty in this work all cast in one block in a dead and dull-coloured material, without apparatus, without organism, with which the best thing that can be done is to hide them beneath a superficial decoration.

In conclusion, the new processes, economic and powerful as they are, are precious from the point of view of certain bold and complex accomplishments. They are devoid of the charm of an artistic expression. Besides, economy is only a relative law and of a secondary character, and the boldness of the structure is not always required. A process which is prevalent from these two points of view does not impose itself to the exclusion of the others. Recourse may be had to it for the economic satisfaction of utilitarian projects, for the realisation of comfort, and for the solution of bold problems. But it will never eliminate from architectural practice the noble and artistic combinations of masonry work in marked-out stones, moulded and sculptured, of frameworks in wood and in metal, of superstructures with vaults, etc.

M. Gaston Trélat (Paris) also contributed a paper, the author's summary and conclusion being: Recapitulating, the buildings we may have to erect or to rearrange answer the requirements of the moment or of the future. What is required is knowledge and experience.

Teaching is not sufficient to develop the necessary capacity. Something more is demanded than a cramming of characteristic facts acquired by instruction. The latter must be completed by a personal training in the profession. It is to be recommended that the latter be not started too late, and that the simultaneity of the two operations be secured. The intellectual and the technical education combined generally carries with it a considerable widening of ideas. It may be infinite; not seldom even it lasts as long as life itself. There exists something like a stimulus to acquire new knowledge, the want of which is accentuated in intensity by the existence of personal ideas. But, above all, it is the true source of the original points of view as opposed to the knowledge acquired by study.

In the exercises offered by the workshop, the laboratory, or by that other vast workshop, which is the nation, education is ever active and imparts a particular course to the mind. Then it is that the capacity for hypothesis and for the ideal asserts itself in matters of science and in matters of art. And is it not correct to say that they are a basis of operation for the study and the solution of the requirements of to-morrow; that they are even the only agents to prepare the realities in relation with the new wants? In the workshop as in the laboratory, where the master always respects, when occasion allows, the point of view which guides the student, this education is accomplished and completed. It takes unexpected and infinite shapes which the personal values alone are able to measure.

These considerations would thus lead us to express the wish that, in art as well as in science, the same method should be put into operation from the intellectual point of view. The work in the laboratory and in the workshop would bring into evidence the variety of the points of view of the different minds. But, taking of course into account the vastness which science has reached at the present time, it is the individual and characteristic mode of action of the apprenticeship in the past that should lead us at the present.

In our times, after Claude Bernard, after Pasteur, to mention only two names borrowed from the nationality which I represent, art and science in the end get so near to each other that they appear to be very intimately related. In fact, from the circumstance of imaginative aptitudes which equally represent the ideal and hypothesis, it would seem that we should endeavour to make them one—at least in the aptitudes for initiative which open an unexplored field for new undertakings. The fact remains that art and science are in our days considerably nearer each other than they were in the past. They are two leading branches of human activity, each having no longer any right to remain indifferent towards the other.

The question of public buildings gives rise to a great many questions which interest our societies. This is one of the general features of the mission inherent to the architect. He must therefore keep in touch with the time and constantly interrogate it about the requirements it may manifest to him.

Science and art enable a selection to be made of remarkable solutions. The consequence is a knowledge and experience which the different modes signalled will call forth. It is useful to propagate their habit.

Mr. Sachs thanked the readers of the papers, and said they had each brought out points which were of the utmost importance to them as architects if they were going to keep the building of reinforced concrete structures in their own hands. He meant chiefly the effect of these buildings upon the public. Reinforced concrete buildings at the present moment were being utilised, many for very utilitarian purposes of the factory and warehouse class, and if the material was to come forward, it was necessary for the architect to settle down and think how reinforced concrete buildings put up in cities were going to be dealt with from the architectural point of view—that was to say, how it should be clothed. It was surely one of those things which should come before their architectural societies and before the students of those societies. The problem was, how to deal with these large flat surfaces, which must necessarily form a reinforced concrete building, and anything which could be done to bring that before architects in the future would be most valuable to the profession, because it would mean that architects would be able to retain buildings of that material in their own hands, instead of such buildings being erected by the engineer.

Mr. F. E. Harris (Manchester) said that, having been instrumental in putting up a few ferro-concrete buildings in this country, it had been frequently asked him what were the qualities of the external walls in relation to non-conductibility. This was, of course, a matter which did not largely apply in connection with manufacturing premises, and up to the present ferro-concrete had been mainly used for such buildings only. If they were to use ferro-concrete for any purpose other than manufacturing buildings they would want to know amongst other things whether the walls were good non-conductors. Their colleagues from America and from the Continent would probably have used armoured concrete for domestic buildings, and would perhaps be able to tell them what the qualities of the walls were in this connection. There was one other point which struck him. The walls were all right, and the effect was all right for manufacturing premises. They could get sufficient effect from using armoured concrete purely and simply, but if they wanted to get any real architectural effect they wanted something more than they got in manufacturing premises. The only way in which they could seem to get that, so far as he had been able to weigh the matter up at present, was by the wasteful use of the material they had, or, as an alternative, to simply use the armoured concrete for the columns and floors. His view at present was that they must simply used armoured concrete for walls and floors, for he did not see how they could get any architectural effect such as would be agreeable to clients unless they limited their use of the materials for the purposes he had mentioned. There was a flatness about armoured concrete which would be objectionable unless they used an excessive amount of material, which, of course, would not be an economical thing to do. He would personally like to have an expression of opinion from their Continental visitors on two points: (1) As to the qualities of ferro-concrete walls for resisting heat and cold, and (2) Whether they found they got a good architectural effect not merely by decorating the outside of the surface, and if so, could they get it economically?

Mr. E. Warren said he would like to introduce a second question with regard to the possibilities of architectural effect, for he was much struck by Professor Cloquet's conclusion dealing with the æsthetic side of the subject. It seemed to him that if they were to deal with plain surfaces in which construction in the architectural sense was absent, they must resort to some merely plastic form of decoration or applied

decoration. To be honest, in dealing with this form of construction, he would like to ask those who had considered the use of the material whether any serious attempt had been made to give it a real constructive or architectural expression, because if there was no constructive or architectural expression in the building, it was not architecture at all. There could be no architectural inspiration, and no architectural enthusiasm could be aroused by dealing with a structure in which they could not give any external expression whatever, and in which no constructive problem arose. If any of the distinguished architects from the Continent would inform them as to what experiments had been made in the direction of the real architectural use of this material, they would all be very much the gainers.

M. Louis Cloquet, replying to the points raised as to the architectural treatment of an armoured concrete wall, was opposed to the idea of placing ornament on the wall. It would, he thought, be a great mistake to place anything on the face of the building which was not part of the structure. With regard to the conductibility of the wall, they found it well to have two partitions with a closed air space in between. Reinforced concrete had been used on the Continent for domestic purposes to some extent. M. Cloquet concluded by referring to the remarks he made in his paper, in which he pointed out that reinforced concrete would never eliminate from architectural practice the noble and artistic combinations of masonry work.

A paper by M. J. Bassegoda was here taken as read, as well as one by M. G. Trélat.

The following is the abstract of the paper by M. Bassegoda (Barcelona) :—

Building in reinforced concrete does not solve any new problem either in art or construction; it is a composite building of stone and metallic materials, by means of which, profiting by the qualities of the two components, difficulties are more economically solved than could be done with either of them alone.

Economy in the use of reinforced concrete does not depend on the low price of the materials of which it is composed, which are comparatively dear, but on their accurate combination, which allows of the quantity being reduced. Economy, consequently, has a limit in the maximum coefficient of ironwork and concrete.

There is no reason why these coefficients, especially that of the concrete, should be higher than in homogeneous constructions, for there are many circumstances, all difficult to foresee, which may produce lower resistances than those which have served as a basis in the calculation; such as quality of the cement, the nature and size of the sand and gravel, and the manipulation and use of the different materials.

This consideration has produced various systems from which cement work has been almost completely eliminated, or in which, at all events, it has not been taken into consideration in the calculation; it is then considered as a simple exterior covering destined to protect the metal against agents which would tend to destroy it, such as oxidation and fire.

Security reaches it maximum in these systems, but, on the other hand, economy diminishes; it may happen that this kind of masonry may become less economical than other homogeneous kinds, such, for example, as brick laid with cement.

In countries where they have excellent brick which, according to an already old-established custom, they use in very reduced thicknesses, either in the parts which give support or in the parts which are supported (arches and horizontal floorings), one might introduce the system of fortifying these constructions, thus obtaining a greater economy in homogeneous masonry work and in fortified concrete work.

In places where construction in brick does not meet the conditions required, the use of fortified cement offers a real and effective economy over all other systems of construction; an economy which should not be exaggerated whilst admitting coefficients of work very superior to those which experience found to be absolutely safe. One can recommend such systems in which the ironwork is adjusted to be able to resist all external force.

With regard to the artistic point of view of the question, reinforced concrete has no exclusive form; on the contrary, like every concretion, it takes that which is given to it. The supporting element, covering an empty space, may be straight (beam) or curved (arch); the length of the former is comparatively restricted; the length of the latter can be much extended, as is also the case in homogeneous constructions.

In the straight form, as in the curved, the theoretical limit of reinforced concrete requires, on account of the weight of the concrete itself, the use of a greater volume of iron in the ironwork than is required in homogeneous metallic constructions. The relation or proportion between the units of resistance and of weight is thirteen times greater in cement than in iron. It follows that in proportion as the absolute dimensions of the works in reinforced concrete are increased, so must the importance of the iron over the cement be increased also, and in consequence the forms then have the characteristics of metallic constructions, as may be noticed in the large bridges.

On the other hand, in architectonic works, in which it is scarcely ever desired to attain the maximum of possible dimensions, the artistic character must come from the lines, projections, and coloration. With regard to the first the architect can choose freely without any restriction; the second, whatever they may be—mouldings, ornamental decorations, etc.—can also be obtained with ease and comparative economy, but with the drawback that for their execution one must have recourse to moulding, which indicates a limitation of artistic effect to which architectonic art cannot bring itself. With regard to colour one cannot admit the only one, that of cement; but, on the contrary, this modern concrete must be treated as the ancients treated it, that is to say, by covering it either altogether or in part with other materials of which the varied coloration permits of obtaining the desired effect being obtained, as certain architects and engineers are already doing who have succeeded in using fortified cement in their works with a particularly artistic effect.

The summary and conclusion of the paper by M. Gaston Trélat (Paris) are as follows :—

To sum up, steel and reinforced cement are destined to see their use become general. Thy are fit to be easily and conveniently used together with other materials, such as burnt clay, and, above all, sandstone; and in this way can be formed a substantial body provided with solidity and of a nature to assure beauty, a quality not to be neglected.

Moreover, the walls built by this method are excellent with regard to the health of the inhabitants in consequence of the absence of dust produced by sandstone, and as offering no harbourage to disease germs, against which an incessant war must be waged.

The advantage of this particularly healthy kind of installation are, above all, to be appreciated when it is a question of buildings to be used as hospitals or refuges or as cheap lodging-houses.

In consequence of the easy disinfection of the walls, the number of dwellings placed one above the other in buildings of great height is considerably more free from inconveniences.

Conclusion.—Steel and reinforced concrete are materials with which it is possible to erect very high buildings, and, at the same time, to reduce the thickness of the parts such as walls and floors. Owing to the mechanical nature of these materials they are provided with resistance to compression and to bending which render it possible to gain useful spaces with regard to the total space covered.

From the plastic point of view they can form a body with the enamelled sandstone, forming walls which have a pleasing effect to the observing eye.

With regard to hygiene, the advantages are not inferior to those which may be expected from enamels in consequence of their delicacy of tone. The enamel of the flamed sandstone allows the construction of walls which are impervious to germs. Finally it produces surroundings whose salubrity one cannot too highly extol.

Solidity, economy of space, plastic beauty, salubrity, are thus four qualities produced by the use of these materials.

Replying to Mr. Sachs, the Chairman said he would be prepared to entertain any resolutions which might be proposed.

Mr. Max Clarke said that in the papers which had been read before the Congress and elsewhere it seemed to have been accepted that the material or combination now known as reinforced concrete was satisfactory in every respect, and the only remark he saw bearing on this particular point was that by Mr. Henry Adams where he spoke of failures, and that "nothing succeeds like failure" was not a pleasant feature of the case. No doubt they would all like to learn something by failures, but they were naturally anxious that such failures should occur, if at all, in other people's buildings, and not in their own. Where they did take place they were not made as public as they should be. Of course, it was quite natural for a man not to let his failures be more known about than he could help, but, on the other hand, as Mr. Adams observed, it was only by such failures that they learned something about a full-sized experiment. They had a very large number of minor experiments, but not of the failures in a full-sized experiment, and that was exactly what they wanted. In Switzerland last month he heard a great deal of conversation with regard to the failure of a building at Basle, but he could not learn from anybody what the actual facts of the case were, and he did not suppose that if he went there now he would be able to find out the cause of this particular upset. Bearing all this in mind, it seemed to him that an inquiry in the direction of what failures had taken place and their causes would be desirable. Another matter to which he thought the attention of members connected with this class of construction should be called was whether any data existed as to the life of the steelwork in combination with concrete. Most people knew it was a most difficult thing to make concrete sufficiently close or homogeneous that it would not allow the passage of air or moisture. If not consolidated enough to make it impervious to these two agents, deterioration might take place in the reinforcing bars, and the structure would lose all the qualities on which its stability depended, and on which the calculations had been based. He took it that this deterioration might also damage the concrete itself, not only the steel rods, for once the steel rods began to rust the rust on them would damage the concrete by expansion, and it would be quite impossible to ascertain what was the nature and effect of the damage (he was assuming that his premises were correct) before the building was so seriously damaged that collapse might occur. They talked in a light and airy manner about adhesion, Portland cement, concrete, and steelwork. They also said that they had seen joists of hoop-iron and other sorts of iron taken out of buildings which had been there for twenty-eight years, and that they could see the original glue on them. That he had done himself; but, on the other hand, he had seen a considerable amount of experimental reinforced concrete, and he had observed that this concrete did not close itself up to the metal, and that there were a number of interstices which had never been filled. They must presume that they were filled with something, and, if it was not with liquid, it was with some vapour, and this vapour, he took it, would be either damp or dry, depending on the state of the weather. This particular phase of this particular type of construction seemed to him to be the one which wanted thoroughly going into. If they erected a building two stories high suitable for an agricultural labourer's dwelling, it did not make much difference whether it lasted fifty years or not; but if they built a building of the monumental type which was supposed to represent a very considerable sum of money, he took it that it was the duty of those who designed the building, or, at any rate, who advocated the use of this material, to be prepared to show what its life would be. So far as he had been able to ascertain no sufficient inquiry had been

devoted to this particular point. They were talking about reinforced concrete because a certain number of gentlemen, whom he called "patentees," and other people called experts, had put the thing on the market. He thought, as architects, they should not be carried away too rapidly. He would like to add that it was quite possible to stick stuff on to concrete, and he had seen it done abroad. They could cast moulds and place them on buildings, but it was not architecture. It was merely sticking a lot of stuff on to a concrete wall. If they were going to descend to that sort of thing in their architecture it would be very much better if they had nothing to do with reinforced concrete at all, for they were going to lose something. One other question he would like to ask, and that was on the subject of cost. No one was able to tell him what the cost of a reinforced concrete building was. If Mr. Goodrich would append to his paper the cost of the building he had described they would have an idea as to whether it was worth their while to depart from their present methods. He moved:—"That it is the sense of this meeting that an inquiry into the cases of failure in reinforced concrete and their causes would be most desirable."

The Chairman formally seconded the resolution.

Mr. Sachs, in supporting the resolution, said it was really of the utmost importance that they should know what the failures were. He was with the mover in Switzerland a few weeks ago when the accident at Basle formed the subject of much discussion, and he made what effort he could to get hold of the actual facts of the case. The facts of that case were available in the form of a report by three Borough Surveyors of three of the principal Swiss cities. It was in the form of a confidential Report to the Basle authorities, but, although confidential at the time (for the accident occurred in 1901), the authorities were good enough to say that for the object of scientific research the Report could be seen. He had a copy of the Report, and he had no doubt but that copies of all such Reports would be at the service of a Committee dealing with the subject. There was a similar case in Alexandria, Egypt, and two or three cases in the United States, and if real independent Reports, and not *ex parte* Reports, could be put before an independent Committee, such as the Reinforced Concrete Committee of the Royal Institute of British Architects or any similar body, and the causes of failure arrived at and the results summarised, they would be the most valuable lessons they could learn from.

Mr. Henry Adams said that, as one who had suggested a new reading of an old proverb, he would like to support the resolution. They were all agreed that ferro-concrete to be satisfactory should be solid, but they had been told, in the first place, that the American practice allowed 2½ in. for the aggregate, while the English practice wisely brought them down to 1 in. But neither of these took account of what, to him, was the most important matter of all, and that was the grading of the material to various sizes. This was brought home to him very closely a short time ago, when, after the Fire-Prevention Committee had discovered that broken brick was one of the best, if not the best, materials which could be adapted, a firm in London commenced to manufacture broken brick and screened it to pass a 1-in. mesh. All the smaller material was done away with. They thus threw away what was the most valuable part. If they had simply removed the dust and retained the particles, from ¼ in. to 1 in., he believed they would have obtained a sounder material. When there were alterations and pulling down of buildings and ferro-concrete was exposed, they all knew that spaces did show in the material, and they should not show. If they wanted proper adhesion to the steel they had the concrete solid. He believed that more than one of the failures would be found to arise from the improper mixing of the aggregate, and he looked upon the grading of the material as one of the most important points in connexion with it.

Mr. Brownhead asked whether, in discussing that question, they really knew what the subject was before them. They knew what concrete was because they had no tests to show what cement was, but when someone said "reinforced concrete" he did not know what it was. He did not know what concrete was because they had no standard, and they could not tell by results what would happen with a particular standard because they had no standard. Therefore they had no reliable information on the subject, and if there was to be an inquiry he would suggest that an endeavour should be made, if possible, to define what concrete was, because concrete might be honestly described as "adulterated cement." That was a very vague term, but all their discussions on the subject were very ethereal and very vague. They wanted some substantial scientific knowledge as to what was the strength of concrete, for at present it was such a vague term. He had heard concrete described as one of good cement and two of other material, and he had also heard it described as one of cement and twenty of another material. Before they could enter on a scientific discussion on concrete they must define what concrete was.

The Chairman said that from something which had been said it might be in the minds of those present that good practice in America justified the use of 2½-in. stone in armoured concrete. It was perfectly true that certain building laws and certain underwriters' rules might permit of such construction, but it was very far from proof that the best architects in America permitted any such construction. The building laws in many States and cities were diverse, but in the principal cities the building laws were coming rapidly to a form in which they prescribed 1 in. or smaller and ¾ in. and smaller of those portions of the concrete which were reinforced with iron. Naturally, in massive concrete, larger stones were permitted. In his own practice, and he thought in that of the majority of architects in America who used armoured concrete, it was the absolute rule that in the portions that were reinforced in the girders especially the size of the concrete should be 1 in. or less and preferably ¾ in. and less. It was not at all to be assumed that because certain building laws permitted the use of other materials that they were generally employed. It always seemed to him that there were so many sources of possible failure in the use of reinforced concrete that it ought only to be employed under the most favourable conditions—that was to say, it must be designed by an expert very capable of calculating the strains, and knowing as much about these strains and the way of meeting them as it was possible to know in the present state of the art. In the second place, the drawings and specifications must be of the most rigorous character, and designed in as great detail as was possible before actual construction. In the third place, the materials must not only be wisely chosen, but they must be submitted to rigorous tests, and, in the last place, the depositing of these materials must be done by persons under the most skilful direction and careful supervision. Only under such conditions could they hope to secure a structure in which they could have faith, and with regard to which they could rest with the assurance that it would be what they hoped it would.

The resolution was then carried.

Mr. Sachs said that, as the subject of fire-protection and reinforced concrete had been so frequently touched upon in the course of the previous discussion, he would propose a resolution which might perhaps seem a little out of place to those who were conversant with the failures of reinforced concrete in fire, but which he thought might serve as a safeguard to many architects in practice. It was:—"That where reinforced concrete is intended to be fire-resisting the greatest possible care must be taken in the selection of the aggregate, its size, and in the protection of the steel; further, that the aggregate does not exceed what will pass through a 1-in. mesh, and that the thickness of the protection never be less than 2 in." The size of the aggregate was of importance—more important to his mind sometimes than the actual mixture of the aggregate. The protection also was of importance, and the reason why he suggested that 2 in. should be put in the resolution was because so many tried to scamp that protection, and they came across reinforced concrete buildings in which the protection to the steelwork was supposed to be ½ in., but where they could scrape it off and find that there was not ⅛th of an inch covering. He would like to add one word as to the fire test. It had been mentioned that 1,400 to over 2,000 degrees were the conflagration temperatures. That was right in America and on the Continent. It was further stated that in the New York rules the test required was 1,700 degrees. People had asked why it should be 1,700 degrees. The standard in this country arrived at at the Congress held about three years ago was 1,800 degrees, and in arriving at this figure the point brought out was this—that in all test-pieces great care was taken to make the test-piece an excellent piece, but in ordinary practice the work could not be of the same quality as the work carried out for a distinct purpose, so both in temperature and time there must be a margin for bad work. There was a consultation between London and New York on the subject, and that was why the high temperatures and long hours were hit upon.

Mr. E. Sewell (Cardiff), in seconding the resolution, said his more particular object in rising was to speak to a portion of the subject which did not seem to have been touched upon. While a good deal of reference had been made to the failure of ferro-concrete, he did not know whether any real experience of such failures had been given. If not, he would like to give an experience of his own of failure in the use of ferro-concrete. He might preface the reference to the failure by the statement that it was a very happy failure and did nobody any harm. In that sense it might tend to illustrate what seemed to him very important possibilities in connexion with the use of ferro-concrete by the architect. In passing, he might say that he had two buildings under construction with that material largely in use, but he recognised a very important disadvantage in using it was that most methods of ferro-concrete seemed to be surrounded by the difficulties of royalties and patents. No doubt, that was a very excellent reward to those whose ingenuity had devised the methods, but, at the same time, one could not help feeling that in practice it was a restriction upon the free and extensive use and applicable use which any building material should have in the architect's mind and on his drawings. To refer more particularly to this question of failure, he might say he had to deal with a building where there was an ordinary street frontage. He decided to use ferro-concrete for the main construction for one reason, which was that the party walls belonging to the neighbours, and for business purposes, it was impossible to interfere with them. He found the convenience very great of being able to construct the girders within his own building instead of having to swing girders and cut into the party walls. This being his first experience of ferro-concrete, he did not think it would be a proper thing to put the front on to a main street of this material. He thought there were chances, architecturally speaking, in the immense advantage they got from the great cantilever methods. He thought the ferro-concrete cantilever and its treatment might possibly in the future become a feature for architects to give their serious attention to, but in this case he had nothing of that chance; and simply dealing with a flat frontage he came to the conclusion that the frontage of the building most be of hard stone. Then came the question of how the whole of the floors and a great deal of the side walls and the girder construction should be legitimately united to the front portion of the building, and he decided to have some steel anchors and anchor the frontage of hard stonework into the ferro-concrete. They found one morning that the ferro-concrete had taken care of itself. They finished their ferro-concrete 8 in. or 10 in. from the front itself, and the anchor was to unite it. But on this particular morning the floors got heavily loaded. A very zealous foreman had removed a certain number of struts in the front, and the whole mass was in just that state that it exerted a pressure towards the front. On examination, he found they were something like 8 in. or 9 in. out of their true plane. The whole of the girders had swelled forward into the front of the building. He did not think they were removed by human agency, but, at any rate, this happy accident had the effect of throwing the girders right into the cavities, and so quite accidentally

they got a united building. It suggested to him that there might be great possibility in the architectural adaptation of the material. It was in that sense waxy; they could alter its contours; and he thought by the use of vertically-curved surfaces there were architectural chances. He did not think at this stage ferro-concrete was sufficiently mobile for their requirements, but it was a great field for architectural study. The application of surface decoration was, of course, quite easily done, and the fact that ferro-concrete was made in wooden sheeting might lead to the sheeting containing some relief which might become decorative.

Mr. E. W. Fritchley (Bombay) said that in India he had used armoured concrete and crushed-stone concrete for the last three or four years. They sieved their stone. It was crushed basalt, and when powdered was as good as sand. They had three or four grades—one between 1 in. and 1¼ in., another between ⅝ in. and ¾ in., and a third was almost a powder; and in no case had he had a failure. They had used it in reinforcing girders, and for three years had used nothing else for floors, because the rat had to be considered, and they found that rats' teeth would not go through armoured concrete.

A delegate suggested that it would be better if the resolution was taken under two heads.

The Chairman said he would accept the suggestion and divide the resolution.

Another delegate expressed the opinion that, as there was a Committee sitting dealing with points such as those discussed, it would be better if both this and the first resolution were referred to that Committee to deal with.

Mr. Sachs said that if the suggestion in the resolution of the 1-in. mesh was not accepted, he would suggest that the motion be taken on general lines, and therefore he amended it so as to read:—"That, where reinforced concrete is intended to be fire-resisting, the greatest possible care must be taken as to the nature of the aggregate and its size and also as to the protection of the steel"

The resolution, as amended, was then put to the meeting and carried.

In answer to a suggestion that the resolutions should be referred to the Reinforced Concrete Committee of the Royal Institute of British Architects, Mr. Sachs said the Committee would be dealing with that, and a special resolution was not needed.

Mr. Ellis Marsland remarked that the Romans reinforced with brick and tile, but they did not leave the brick-concrete bare. They covered it up with stone and marble and other materials. He thought they were going away from the fact that reinforced concrete was a constructional material, like ordinary steelwork used for building, which was, as a rule, covered up, and he felt that it would be perfectly legitimate to cover up this reinforced concrete by either stone or brick or concrete.

M. Augustin Rey proposed:—"That this Congress considers that reinforced concrete may profitably be employed in the construction of economical buildings of several stories or working-class dwellings."

Mr. Sachs pointed out that this was rather a wide resolution after all they had heard as to the possibilities of reinforced concrete in general. They had to be satisfied that ferro-concrete was suitable for buildings in general before they tried them on the working classes.

The resolution was defeated.

Mr. Peter B. Wight, F.A.I.A. (Editor of *Fireproof Magazine*, Chicago, U.S.A.), contributed a paper on "The Use of Burned Clay Products in the Fireproofing of Buildings in the United States of America. He said:—

The purpose of this paper is to treat of the actual use of burned clay in building construction according to the present practice in constructing fireproof buildings in the United States.

Historically burned clay is the most ancient of building materials, and natural clays can be found almost everywhere. Kinds of clay referred to. Refractory clays most useful, and generally within the reach of all.

Natural variation in qualities of clays treated of, showing universal standards of quality cannot be maintained. Improper clays are often used, the result of ignorance and want of principle The best can be had where the disposition is to pay for their full value.

Properties of burned fireclay described. Methods of fabrication. Porous terra-cotta and semiporous terra-cotta preferred. Cellular terra-cotta.

Use dates from 1878, but had been used in form of brick-floor arches from the introduction of I-beams in 1855. Flat, hollow arches invented in France by Garcin in 1868. Same used in the United States, 1871 to 1878.

Inventions were numerous from 1870 to 1880, but few were practicable or brought into use. Invention of sewer-pipe press gave great impetus to manufacture. Same is still the means of cheapening product. Very few patents now in force.

Porous terra-cotta first made at Chicago in 1872. First used for roofs and afterwards for protecting cast-iron stanchions at Chicago and Milwaukee. Method described. Flat arches of hollow porous terra-cotta used in Patent Office, Washington. Girders and roof trusses protected with porous terra-cotta at Milwaukee and Washington.

General interest in the necessity of fireproofing the iron constructive members in buildings was first elicited as a result of investigations of effect of fire on incombustible buildings in the Chicago conflagration of 1871.

Great building revival at Chicago in 1880 caused demand for fireproof structures to replace earlier buildings. High buildings were demanded, and the main problem to be solved was how to build them fireproof and light enough to stand on elastic clay soil, which could only sustain 4,000 lb. to the foot. Solved by making flat floor arches very light. Foundation problem solved by first using iron rails in concrete with increased offsets. Invention of grille foundations followed. Structural steel I-beams first made in 1885, and steel for columns with complete steel skeleton construction perfected in 1888. All steel in these buildings was protected by tiles of various kinds. Several methods for building floors and roofs employed.

Grill foundations on yielding soils are now superseded by concrete piers, built in tubs, down to hard pan or rock.

The first fireproof ten-story office building in Chicago, fireproofed on modern method, has already been removed to make room for a larger and more expensive structure, eighteen stories high, which embodies all the improved methods of fireproofing used at the present day.

Thin-walled, hard, hollow tiles have been superseded by thicker-walled, hollow, porous, and semiporous tiles for all purposes. Machine-made material only is used. Limits of practicable thickness described.

Burned clay fireproof materials classed under two heads; one of materials used constructively under pressure, such as floor arches, and all other arches and partitions; the other comprises all the forms used for the protection of the steel constructive members.

Floor construction described in detail. Flat arches formerly used on the side-pressure principle are now used on the end-pressure principle.

Protection of soffits of I-beams described. Same used for all forms of arches. Segment floor arches described. Compared with flat arches. Flat terra-cotta floors with steel-tension members described. The Johnson system. The Bévier system. The Kahn system.

Hollow-tile partitions are described. Defects in former methods, and methods of setting and trimming described. Partitions take the place of brick division walls. Underwriters' laboratories at Chicago referred to. Their great strength to bear loads.

Fireproofing constructive steel members is next considered. Fireproofing iron and steel stanchions the most important. Many methods described and illustrated.

Girder protection is next described and illustrated.

The Guastavino "cohesive system" of fireproofing with fireclay tiles described. Especially adapted to construction of domes; is monolithic; a laminated combination of flat tiles and concrete.

Fireproofing in the Pittsburg Terminal Warehouse described. Construction is on a similar principle to that of Guastavino.

Construction of grain-storage tanks for "elevators" with hollow tile described. The construction of the old style of elevators with wood and brick bins perfected by Geo. H. Johnson, and the modern fireproof elevator perfected by his son, E. V. Johnson.

Difficulty in covering the subject intelligently in brief time given. Statistics omitted. Modern methods have proved to be saving methods.

Conclusion.—The American system is not impracticable in any other country on account of cost. Experience, as well as fabrication in large quantities, will reduce cost. High price of labour in the United States should naturally make it more expensive there than elsewhere. Reduction in cost of transportation an important economic item. The whole subject especially pertinent to the present occasion. We are here to learn as well as to teach each other at the same time; to contribute what we know to the fund of information to be here accumulated for the benefit of our brethren throughout the world.

A contribution on the subject was made by Professor Henry Adams, M.Inst.C.E.:—

So much has been written during the last four or five years upon the use of concrete and steel in combination that there is practically nothing new to be said. Those who have studied the literature of the subject will probably have been struck with the number of different terms used to express this mode of construction. "Bréton armé," and the English equivalent, "armoured concrete," are perhaps the least appropriate. "Reinforced concrete" gives undue prominence to one element to the total exclusion of the other; "concrete-steel" is less open to objection, but the writer prefers the term "ferro-concrete" as being self-explanatory of the intimate combination between the two materials, the more important one coming first. A superficial criticism might allege that *ferrum* is iron, and therefore not applicable to steel, but steel is generically iron, and the term is therefore quite appropriate.

In early designs no provision whatever was made to resist the shearing stresses, which were either overlooked or ignored, and it is interesting to observe the gradual recognition these stresses obtained in the hands of the designers, until in recent construction they receive nearly as much consideration as what are called the "direct" stresses of tension and compression. The importance of considering shear was brought prominently under notice by the failure of experimental beams which had no special provision for meeting the shear stress towards the ends, where, of course, it is greatest. Various methods are employed in the different systems, but the Kahn trussed bar seems peculiarly suitable. the fin on either side of the core being left attached throughout the middle portion where the tension is greatest, and separated and bent upwards towards the ends to take the shear where the tension is least.

The question of adhesion between the concrete and the steel at one time caused some anxiety. It was naturally supposed that with increase of temperature the steel would expand more than the concrete, and it was thought that this would be sufficient to impair, if not to destroy, any adhesion that might be otherwise obtainable. As a matter of fact the linear change for a given variation of temperature is about 15 per cent. less for concrete than for steel, but when the actual figures are compared the difference is very trifling. Taking the range of temperature between summer and winter as 70 deg. Fahr., the change of length in 100 ft. produced by this variation of temperature will be for steel 0·546 in., and for concrete 0·464 in., the difference between the two materials in a length of 1 ft. being less than a thousandth of an inch.

With equal care in mixing the concrete the adhesion varies with the condition of the surface of the steel. When coated with red oxide paint it is extremely slight, and even a bituminous paint reduces the adhesion below that due to a clean unprepared surface. It is, however, found that the best adhesion occurs when the steel is rusted all over before being embedded in the concrete. This appears to be due to the formation of some chemical compound, or salt of iron and lime, which may not be detrimental in the absence of further moisture, but the final result is doubtful in such cases as reservoir walls,

tanks, and dams. Painting the steelwork over with cement wash is a simple method of commencing the contact, and this would seem to prevent further rusting, on the principle of the pail of limewater into which the Sheffield grinders dip their small goods to resist the tendency to rust when left wet.

Professor Bauschinger found the ultimate adhesion to be from 569 lb. to 668 lb. per square inch, but Mr. J. S. Costigan found it not to exceed 65 lb. per square inch. Probably, in the former case it was measured by the resistance of a rod to withdrawal, and in the latter by the insertion of small plates in a briquette. At any rate it is not safe to reckon upon more than 50 lb. per square inch as a working load for adhesion. Allowing 16,000 lb. per square inch as the working load on steel, the embedded length that would make the strength and adhesion equal would be 16,000 times the sectional area of steel in square inches divided by fifty times the surface area per inch in length, or, briefly, $320\ a \div s$; so that a $\frac{1}{4}$-in. square bar embedded for a length of 20 in. would be equally strong against tearing or slipping, and similarly a 1-in. square bar would need to be embedded for a length of 80 in. There are many different constructions in which this fact may be of importance; for instance, in a simple beam, if the span is less than twice the above lengths, there will be a tendency for the rod to draw before the tensile strength is utilised, unless the ends are turned up to form cleats. In the edge of a circular ferro-concrete tank, instead of overlapping the ends of the rods, for which the above distance would be a minimum, it would clearly be more economical to turn up the ends and slip a welded link over them. There are several specially-prepared bars giving greater resistance to withdrawal, *e.g.*, the Ransome twisted bar, the square corrugated bar, and the Columbian bar, which relies for efficiency upon its large surface area compared with its sectional area, but plain rods which can be obtained everywhere should be adopted whenever possible, on the score of economy and avoidance of delay.

Ferro-concrete does not at first sight lend itself readily to architectural effect; the warehouses and coal stores constructed of it can hardly be called visions of beauty, but some of the recent arched bridges have a decidedly pleasing effect, and when the adaptability of the compound material becomes better known we may confidently look forward to the expression of taste as well as utility in the designs.

Perhaps the greatest departure from existing models occurs in the construction of ferro-concrete retaining walls. Hitherto we have looked upon weight as the essential element of such walls, and stability has been secured by leaning this weight against the bank of earth to be supported. We are now confronted with a new type in which added weight bears no part; the only weight employed is that of the earth itself. The construction consists of a skin of concrete reinforced with steel rods, securely and continuously attached to a similar base and forming with it two sides of a triangle. The face wall is then kept in position by rods protected by concrete, tying the inner edge of the base at intervals to the face at one or more points of the height. It does not follow that, because the centre of effort of the thrust occurs at one-third of the height, that that is the proper place for the connexion to be made; it would be if the wall were disconnected at the bottom, but, being firmly secured there, the point of attachment should certainly be higher than one-third. If the stiffness throughout the height be uniform the point of attachment should be about 58 per cent. of the height. There are some other rather nice points of calculation about these walls which the writer does not propose to go into now; he would only point out that, apart from strength, the stability is obtained by the weight of earth resting on the base. Other examples of these walls have reinforced counterforts 6 in. to 9 in. thick extending to the whole height at intervals of 8 ft. to 10 ft. in the length, and others again have reinforced buttresses at similar intervals, and in one case the writer has seen the base of the wall extended in the front instead of at the back, so as to react by pressure at a considerable leverage, but this method does not appear to be so economical as that previously described.

There are, no doubt, many other uses to which ferro-concrete systems may be applied. Englishmen are naturally conservative; they like to feel that in their adoption of any new system they are not running too great a risk, and a novel form of construction such as this must undoubtedly have some failures, but, paraphrasing the old saying, the writer would urge that "nothing succeeds like failure." It is from failures that the greatest knowledge of true principles can be obtained, and therefore we should be grateful to those pioneers who do venture to take risk, even at the sacrifice of some reputation.

Mr. E. Warren proposed a vote of thanks to the Chairman, and the sitting of the Section was adjourned.

Visit to Hatfield House.

Some excellent arrangements were made for the excursion to Hatfield, when a large party of ladies and gentlemen, numbering about six hundred, availed themselves of the opportunity for seeing this historic house. The visitors were welcomed upon arrival by Colonel Eustace Balfour, himself an architect and member of the illustrious Cecil family, who discoursed upon the features of the great park and gave short addresses upon the history of the buildings. Much interest was taken in the brick Tudor buildings standing to the west of the great house, now used as stabling. Here stood a palace belonging to the Bishops of Ely, where Elizabeth and Edward VI. were frequent visitors; but the three sides of a great quadrangle were demolished when the new mansion was finished, leaving the fourth, consisting of the banqueting hall and offices, now used as stabling. The former magnificence of this palace is indicated by the fine brickwork of the exterior and by the beautiful open timber roof of the interior.

Hatfield House, commenced in 1607, may be taken as a typical example of the many great houses which were erected in England in the peaceful times of the Early Renaissance which followed the reign of Queen Elizabeth. The foreign intercourse existing at the time influenced the trend of the arts of Britain, and the architecture of Italy in particular has clearly affected the English work at Hatfield. The long, low buildings gave place to houses of many stories, with apartments of great height, while provision for defence almost disappeared. The plan here is the ⊏ type, the favourite form of the period, with the principal front facing south, in the centre of which is an open colonnade with portico, built in 1611 of Caen stone. The depth of the main building and of the wings is greater than usual considering that the floor and roof spans are those of ordinary timber limits. The façades have considerable breadth of treatment, and the numerous bays and turrets are generous in scale. The north elevation is perhaps the simplest front, and is yet far from appearing severe. The brick-facing shows to its fullest advantage in colour and depth of joint, but the completeness of this façade is rudely interrupted by the unpleasant scale of the large plate-glass windows. Surely this otherwise perfect specimen of an historic English mansion should not be found wanting in such a matter of detail as windows, which are here crying out for lead-glazing.

A peculiar feature is the flat roofs; parapets become necessary, and add to the height of the walls. The pipes and heads for taking off the rain-water are of much interest, as also are the chimneys, built of brick, arranged in heavy groups.

The extensive accommodation of the house may be best understood when it is remembered that there are eleven staircases. The great hall is 50 ft. by 30 ft., two stories high, and has a musicians' gallery at the east end. The drawing-room is in the east wing, and is approached from the grand staircase, one of the finest of the period. Oak is used throughout the landings and great wide flights; newels are plentiful, enriched with great armorial and other finials, and are generally carved throughout their full height. The folding-gates at the foot of the stairs were intended to keep hounds and other interlopers from the private apartments. The cloister, or colonnade, now called the armoury, is immediately below the great gallery, which measures 163 ft. by 20 ft. The great chamber, the library, and the chapel are other noteworthy apartments.

Hatfield House was one of the first mansions to possess a basement story, and here the domestic offices are to be found. The interior generally is of great interest. There is a remarkable wealth of oak-panelled walls, elaborate marble chimney-pieces, and ornate plaster ceilings, gilt and coloured with armorial decoration. Pictures of great value, chiefly portraits, furniture, and objets d'art play important parts in the finishing of the interiors.

Hatfield is beautiful in its setting. Avenues of trees lead up to wide walled courtyards on the north and south fronts, while pleasure gardens are to be found on the east and west sides. Upon the latter aspect is the old privy gardens, measuring 150 ft. square, inclosed by pleached lime alleys, which afford welcome shade. A circular pond, with fountain, occupies the centre space, and is surrounded by flower parterres and yew hedges, while the remainder comprises grass lawns in pleasing proportion. Here, adjacent, is a charming sunk rose-garden, laid out in geometric form, and upon the present occasion the roses were at the height of perfection. On the east side is a fine walled terrace, with flights of steps leading to a tennis lawn, while beyond this is the maize. This quaint feature of the Elizabethan Period is rectangular in form, varied in a zig-zag manner, and consists of narrow alleys between yew hedges. The top of the hedges is level with the tennis lawn, which is interesting from the fact that the general line of the ground produces the terraced treatment of the lay-out. The gardens give the general impression of being too small in area and in part for the big scale of the house.

The visit concluded at 5 o'clock, and after refreshment had been partaken in the village the members of the Congress returned to town fully interested in all that had been seen during a most successful afternoon.

The programme of the Congress also included a visit by other members to Hampton Court. In the evening the Lord Mayor gave a conversazione at the Mansion House, which was very largely attended, and where there was excellent singing in the large hall.

WEDNESDAY'S SITTINGS.

Conduct of International Architectural Competitions.

Dr. H. Muthesius (Germany) presided at the sitting held at the Rooms of the Institute on Wednesday morning, when papers were read on the "Conduct of International Architectural Competitions":—

M. J. Guadet, Inspecteur-Général des Bâtiments Civils, Professeur à l'Ecole Nationale des Beaux-Arts, Membre du Conseil Supérieur de l'Instruction Publique, read the first paper, the following being an abstract:—

The Advantage of International Competitions.—These competitions are legitimate in certain circumstances. It would be dangerous to have recourse to them without advantageous motive.

Examination of this question:—

The possible scope of the Competition.—The result of every competition is only a preparatory scheme, the preliminary design with estimate of expense. It cannot produce a definitive design; this must be elaborated afterwards.

The cost of the competition should be kept distinct from the cost of the execution of the building.

In international competitions especially it is dangerous to promise the execution of the work to the author of the first premiated design.

Conditions of the Competition, Regulations, and Programme.—These conditions contain two elements: regulations and programme. For both the advice of experienced architects is indispensable.

The regulations must allow the same time to all competitors.

Programmes must be given out simultaneously in every country.

The programme should be issued everywhere in the language in which it is drawn up and not in translation.

Every further communication should be addressed to all the competitors.

During the competition no change should be made in the regulations governing it.

The same date for sending in designs should be obligatory everywhere, and designs should be sent in to a place specified for each country.

The premiated designs should become the

property of the promoters, but without prejudice to the laws of artistic copyright.

An exhibition of designs before and after adjudication is necessary.

The regulations must indicate whether the designs should be signed or distinguished by a motto; signature is best, but the adoption of a pseudonym should be allowed.

No envelope containing an author's name should be opened without his consent, except in the case of premiated designs.

The technical programme should be clear, precise, and drawn up under the advice of experienced architects. It should avoid directions which cannot be followed, and should not impose excessive work by means of drawings that are useless or to too large a scale.

The competitors' personal expenses should be reduced to a minimum.

Assessing the Competition.—The jury should only consider justice.

The conditions constitute the contract; a matter of law between the parties.

Every design, no matter how attractive, which violates the conditions should be disqualified.

The jury, necessarily competent, should be composed of architects.

The promoters who are interested should be present in a consultative capacity.

The jury should classify the designs and allocate the premiums.

The jury should be formed of architects of each nation represented in the competition in the proportion of one assessor to ten competitors or fraction of ten afterwards.

Every nation represented by less than ten competitors, with a minimum of five, should have the right to one assessor.

The architect assessors should be elected by the competitors of each nation, each name receiving an absolute majority of votes.

Study of the Working Arrangements.—To obviate non-acceptance the competitors should elect simultaneously an equal number of supplementary assessors.

The jury should elect their president, secretaries, and reporters.

The jury should be master of their procedure, but they should not be able to modify the distribution of the premiums, nor the total amount.

Vote by proxy should be forbidden.

The judgment of the jury should be final and without appeal.

Competitions in Two Stages.—Special conditions for these competitions.

The first and second competitions are different things, and should not be confused one with the other.

For the first stage a large sketch plan is sufficient.

The chosen competitors should be indemnified for the cost of the first competition. They should not be classed, and the premiums should be reserved as an extra matter for the final competition.

It is preferable that the first competition should not be exhibited, all the sketches being preserved so as to be exhibited with the final competition.

The regulations ought to specify that the competition be in two stages. This decision should not be taken afterwards.

The regulations should fix all the dates.

They should prescribe the minimum number of accepted competitors who, after the first competition, should receive the stipulated honorarium. They should make known the premiums granted in the final competition.

The jury in the first competition should also judge the second, latitude being given to the accepted competitors to add additional assessors.

The regulations should be final for the two competitions, but the programme should be given for the first alone, subject to modifications for the final competition.

The following rules, proposed by the Society "Architectura et Amicitia" (Amsterdam), were read by M. Berlage.—

The Society "Architectura et Amicitia" (Amsterdam) proposes to the Committee of the Seventh International Congress of Architects the following rules to serve as a basis for "the organisation of public international competitions for architecture." These propositions having been made by a special commission of the members of our Society, they have been decided upon as definitely approved at the meeting of April 18, 1906.

ART. 1.—The International Congress of Architects frames some regulations in accordance with which permanent competition commissions are constituted, representing the architects of a country or also of various nationalities combined, which will act as representatives of the profession of architects in the preparatory measures at the international competitions. The commission of the country in which the competition is to take place will assume the management of the business. The presidents of all these commissions constitute together a Central Council, to which is entrusted the control of the international regulations and the eventual propositions made to the International Congress concerning alterations to be made in these regulations.

ART. 2.—The international competitions shall by preference take place in two sections. Preliminary competitions shall be opened in the various countries, or groups of countries, through the medium of the permanent commissions of the competitions. The admission to the final competition will be limited to those who earn distinction in the preliminary competitions. An honorarium shall be distributed to all the competitors in the final competition, the number of whom is limited for each country or group of nationalities by the International Congress.

ART. 3.—The conditions of the competition must be the same for all competitors. Exceptional conditions, no matter under what form, are prohibited. The delivery of the designs must be made anonymously.

ART. 4.—The date of the sending off, proved by the stamp of the stations of departure, which must be delivered to the jury, shall be taken as the final term for the closure of the competition. The programme of the competition shall be published or placed at the disposal of the applicants in all the countries, or groups of countries, at the same date.

ART. 5.—The jury of an international competition will in principle be formed by half the number, less one, of the members of the nationality of the country in which the competition is opened. Architects must form the majority of the members of the jury. The names of the members of the jury and of their substitutes, with the declaration which contains the approval of all the conditions, shall be inserted in the programme.

ART. 6.—The jury of the country in which the competition is held forms the information bureau. The publication of announcements relative to the competition will be made in such a manner that it may be considered to have come to the knowledge of all interested parties. These announcements shall have the same value as the conditions of the programme.

ART. 7.—The programme must express in precise terms the conditions made, making a distinction between the absolute requirements and the optional requirements. It would, however, be preferable that optional conditions should not figure in the programme of the competition.

ART. 8.—The number of drawings to be sent is to be limited to the quantity absolutely necessary in order to avoid all useless work and superfluous expense. For the provisional competitions, sketches, eventually accompanied by approximate estimate of costs, will be asked for. Any drawings sent in which have not been asked for in the programme will not be submitted to the judgment of the jury. The programme prescribes a uniform manner of treating drawings to enter into competition. Every delivery must be accompanied by a declaration that the project is the artistic copyright of the competitor.

ART. 9.—Should the sum available for the execution of the design be absolutely fixed, the programme must indicate the necessary particulars for the uniform working out of the estimate of costs either in detail or approximately. The expenses for the foundations will not be included in these estimates. The programme will have to contain very precise indications with regard to the character of the soil, the site, the foundations, and the surroundings.

ART. 10.—The total amount of the prizes to be distributed shall be at least equal to double the amount which would be paid for the architectural part of the work carried out to an architect who had been entrusted with the execution of the design. It must be admitted as a principle that the execution of the design shall be entrusted to the successful architect, under the conditions which are in force in the country of such competition. The amount of the prize shall not be deducted from the amount of the honoraria to be paid. Should the promoters of the competition desire to reserve to themselves the option to dispense with the services of the architect declared to be the author of the best design, the programme must set out the terms of indemnity. Should the work not be carried out, the same indemnification should be paid to him. In all cases the designs sent in shall remain the artistic copyright of the competitors.

ART. 11.—All the designs shall be publicly exhibited for a sufficiently long period in order that the competitors may be able to visit this exhibition, which shall be announced beforehand in the architectural publications. The complete and detailed report of the jury shall be published in the architectural periodicals before the opening of the exhibition, so that all the parties interested may have knowledge of it. The report of the conclusions of the jury of the preparatory competitions shall be communicated to the successful competitors sufficiently previous to the definite competition.

The following are the summary and conclusion of a paper by Gaston Trélat (Paris):—

The argumentation of the previous subject bore, in the first place, on the spirit which in general dominates architects. Contrary to the intentions of a generous application of art, the architect often seems too pre-occupied about not doing certain things. And one spends a good deal of time in learning those things which must be avoided. Wasted years! it seems: how much more preferable would be an education which faced the realisations to be deduced from contemporary science? This would adjust itself to the standard authorised by experience.

Competitions, as they are now held, have not the scope they ought to have. Conventions take up too much place, one has a sense of things learnt: book-keeping of a kind and without influence on the mind of the masses.

Public beauty, like public health, corresponds to the contemporary movement of democracy, of which these two capitals are a momentary crowning. The architect has no right to separate himself from it if he wishes to fulfil the function expected from the social competence it is his duty to show.

Internationalism and publicity will give to competitions a youthfulness and a vitality which they have not had up to now, and which are a part of the movement of contemporary effort.

These competitions should have exclusively in view the services of which they are the object. It must be so, in order to insure to the operation a normal rectitude which would keep it above the paltrinesses which are too well-known and are lowering to art, causes lowering alike for competitors and judges, and injurious to the solutions to be gathered.

The competitions being international, the nations taking part in them through their artists will all include the same number of judges.

In this way the competition agents, whom the judges represent, will doubtless be less inclined to look upon themselves as a delegation having to represent the interests of compatriots, or the idea in fashion currently admitted in their country. The jury will be more particularly engaged in selecting and bringing about a solution, while the competitors themselves, in consequence of the absence of preconceived ideas represented with a show of authority, will strive to elaborate and present different sides, to the exclusion of all party spirit. And, in these days, if one wishes to respect personalities alike useful in art and in science, it is impossible to be sufficiently on one's guard against these fatal influences. In effect, whatever may be the interest of contemporary evolution, with its abundance of curious observations and generous comparisons in their knowledge, ill-luck will have it that, in revenge, we must endure the narrow ideas of little groups and clans, which bring confusion into the service of the human collectivity. It is, however, to this that all our efforts should directly refer, free from this impediment, very regrettable socially.

To bring this *résumé* to an end, with regard to competitions I must again say that the spirit of argumentation followed in these lines endeavours to ensure the supremacy of the decision, uniting the choice of the work and the choice of the artist charged with its execution. The author of the first idea ought to complete the studies and accomplish its realisation. And

the same spirit which the decision has intended to make clear will be found in the accomplished work. This is how things should go, if one would keep to the rectitude that the situation demands and respect the responsibility that the decision imposes on the jury.

And the organisation, as sketched here in its characteristic features, would perhaps be destined to give results still unforeseen. But this would be on condition of always keeping in the path that would normally be deduced therefrom, once agreement was come to on the ideas which support the solution I submit to the Congress.

Conclusion.—Without consciousness there is neither art nor artist. It is only by a wide comprehension of things, all leading to the consciousness of his time and of humanity, that the artist can do a useful work. In these days the widening of science serves as a basis to this consciousness. And the applications of the art take a special character in order to supply the needs and aspirations of the period.

The organisation of international competitions showing a greater amplitude of intellectual horizon would be in accordance with the ideal of the day.

Again, these competitions would have the advantage of extending the character of educations which up to now have remained restricted to present requirements.

But measures would have to be taken to ensure the entire liberty of intellectual expansion amongst the artists entering into competition, to afford the jury an unlimited independence and to enlighten the conscientiousness of the verdict they would give.

M. Weeldenburg (Holland) also read a short communication on the subject as follows:—The Society of Bouwkunst et Vriensdchap of Rotterdam, while recognising the great initiatory value of the propositions made by the Society "Architectura et Amicitia" of Amsterdam, for the regulation of International Competitions, considers—

That the suggestions made by the abovenamed Society should be more widely extended. This opinion is based on the experience acquired at the last International Competition for the Peace Palace at the Hague.

This last competition has clearly proved that it is necessary to paraphrase the principal duties of the jury of competitions in general, and of International Competitions in particular. The Society Bouwkunstndschap et Vrie of Rotterdam is of the opinion that it is preferable that the new conditions (*rédaction*) be drawn up by a Special Commission, and that a motion (conclusion) be presented to the next, the eighth, International Congress of Architects. In order to give a wider scope to the propositions made by the Society of Architectura et Amicitia of Amsterdam, the Society Bouwkunst et Vriendschap has the honour to present to the seventh Congress the following motion:—"That in view of the fact that the proposition of the Amsterdam Society of Architectura et Amicitia, presented to the seventh International Congress, deserves to obtain greater scope, therefore the Permanent Committee of the Congress shall chose a preliminary (*préparatoire*) commission, on which the Amsterdam Society of Architectura et Amicitia shall be represented. This Commission to consist of seven members."

Signor M. E. Cannizzaro (Italy) seconded the motion.

M. Georges Harmand (France) said the subject was a most important one, and he thought the various records ought to be collected and sent to the Permanent Committee of the Congress; that Committee might study them and present a report to the next Congress. He moved as an amendment, "That the papers be sent to the Permanent Committee of the Congress, who shall get out a special report on this topic for the next Congress."

Mr. Totten seconded the amendment, and said he would like the Committee to be instructed to suggest the method of the selection of the jury.

Signor Cannizzaro spoke in favour of sending the matter to a special committee of seven members elected or to be elected by the nations who constitute the Congress. He objected strongly to the matter being sent to the Central Committee, because that Committee was only at the beginning of its experience—it was a Committee started at the last Congress, and its real duty was the organisation of the Congress. It was not a Committee which had to go over the topics discussed at the Congress, or to deliberate on matters which affected the profession all over the world. He thought the Special Committee, as suggested, should be selected, and that they should get to work and prepare a report which might be sent to the Central Committee printed and distributed all over the world.

M. Harmand said that the Permanent Committee was established at the Paris Congress to choose the place of conference, and also the topics which should come before the conference. If they chose a Special Committee in the manner suggested what would become of it? They would only have until Saturday to do the work, and that was altogether too short a time in which to deal with it. When the Congress was closed it was only the Permanent Committee which was left. He thought the matter should be sent to the Permanent Committee and dealt with by them. He moved an amendment that the matter be sent to the Permanent Committee.

Mr. Totten said the Committee to deal with the subject should not consist of seven but of one representative of each country associated with the Congress.

Signor Cannizzaro pointed out that this was the same thing as asking the Permanent Committee to take the matter in hand.

After some further discussion Signor Cannizzaro appealed to M. Harmand to accept his motion.

M. Harmand thought it would be better to discuss the question the following morning.

The Chairman said the original proposition was to elect a committee of seven members, and the amendment of M. Harmand was to transfer the work to the Permanent Committee. There was, however, a way of uniting both parties by allowing a selected committee of seven to do the work until the close of the Congress, and they could submit their work to the Congress on Saturday, and it could then be transferred to the Permanent Committee. He suggested that this was the best thing to do.

M. Harmand agreed to the suggestion.

Mr. Middleton said he thought the amendment of M. Harmand was a very reasonable one, and they ought not to appoint any Special Committee to go over the Permanent Committee.

The proposition was then put as follows, and carried:—"That the Congress, taking into consideration the reports submitted, recommends them to the examination of the Permanent Committee of the Congress in order that they may submit a special report to the next Congress."

A delegate asked if the Permanent Committee would appoint a Special Committee or would they do the work themselves?

The Chairman said that they had just decided that the work be referred to the Permanent Committee, and it would be for that Committee to consider whether they would appoint a sub-committee.

Finally it was decided to refer the whole question to the Permanent Congress Committee.

M. Rey (Paris) proposed the final resolution:—"That the Permanent Committee of the Congress should appoint a Special Committee of seven members to examine thoroughly the whole question of competitions, and that the latter committee should present their report to the next Congress."

On behalf of many vitally interested *confrères*, he urged that "the programme shall declare that in view of his position on the jury, no member of the same shall have any direct or indirect material interest in the execution of the work put up to competition. It is important that the jury, which is a tribunal without appeal, shall be able to give a full moral guarantee in this respect. All the more so, because at the present day many eminent architects of all countries refuse to take part in public competitions, when this essential claim is omitted from the programme."

Mr. Middleton said he could see no reason for such a motion. If the matter was referred to the General Committee he did not see how they could tie their hands as to the way in which they thought best to deal with the subject. At present they would be left a free hand as to what sub-committee they would appoint.

The Chairman remarked that that was exactly his own view.

Mr. Hare suggested that it would be better to send the matter forward as a recommendation from the meeting rather than as a resolution.

Mr. Totten then moved that the motion be sent forward as a resolution, and it was seconded by M. Harmand, and carried.

Ownership of Architects' Drawings.

Mr. W. S. Eames (United States) succeeded Dr. Muthesius in the chair when this subject was discussed, and Mr. H. Heathcote Statham read a paper of which the following is an abstract:—

The question is distinct from that of architectural copyright in designs, with which it must not be confounded. It turns on the question whether the drawings and specification made by the architect in order to carry out a building are to be retained in his custody or to be handed over to his client. In France and Germany no legal question is raised on the subject: the architect retains the drawings as a matter of law. In England the custom has been almost universal in the same sense. But in the case of Ebdy *v.* M'Gowan (1870), the Court ruled that, the building not having been carried out, the drawings must be handed over to the client on his paying for the time expended on them. In the case of Gibbon *v.* Pease (1904), the Court, to the surprise of architects, ruled that the precedent of Ebdy *v.* M'Gowan covered all cases, whether the building had been carried out or not, and that the client had a right to demand all the drawings, the Court refusing to hear any evidence on the side of the architect, whose drawings and specification can therefore, in England, be legally claimed by the client, although he already has what he really paid for—viz., the building itself. It is pointed out that an architect is not paid for making drawings, but for producing a building, the drawings being only his necessary instructions to the workmen; under some circumstances he might even dispense with drawings altogether. To require him to hand over to the client drawings and specification, which represent the result of his professional experience over many years, for the client to use as he pleases is a manifest injustice to the architect. Moreover, the custom in the profession of handing over the drawings to the client when the building has been planned, but *not* carried out, is a mistake on the part of the profession; as in such a case an unscrupulous client has only to say that he has changed his mind in order to get possession of the drawings and use them as he pleases, with no further compensation to the architect. The wording of Clause I. of the Institute Scale of Charges is most unfortunate, as it appears to state (though not so intended) that the architect's commission is for producing drawings of a building. The wording of this clause should be amended. Th author moved the following resolution:—

"That, in the opinion of this meeting, the Royal Institute of British Architects, having revised the wording of its paper on the professional practice as to the charges of architects in the sense indicated above, should as early as possible take steps to get a Bill introduced into Parliament for securing the adoption of their scale of charges, so amended, as part of the law of the land."

M. Harmand expressed the opinion that the matter could be dealt with in association with the subject of copyright.

Mr. Hudson seconded the resolution moved by Mr. Statham.

A discussion arose as to whether or not the question of the ownership of architects' drawings and that of artistic copyright should be taken together.

M. Harmand thought it would be a mistake to separate the questions, for copyright gave a right to keep the drawings. What Mr. Statham said as to this being an English question was very true, but they all hoped that the British Parliament would pass a law which would settle the copyright question.

The Chairman thought they had better consider the question of the ownership of drawings apart from the question of copyright. The resolution of Mr. Statham would not interfere with any similar resolution with regard to copyright law; but while one measure might pass and have a good result, yet a combination of the two subjects might mean a failure of both.

Dr. H. Muthesius (Germany) said that the question raised by the reader of the paper was not one which concerned England only, but it was one of international importance. He would rather like to have it such a way so that the Congress might be concerned with it as an International Congress, and not as an English Congress. To his knowledge the circumstances were entirely

the same in Germany where in any law case this uncertainty arose as to whom the drawings belonged. Their judges, however, were inclined to take the conclusion arrived at by professional bodies, and if an International Congress gave as its firm opinion that the charges of architects did not refer to any drawings, but only to the executed building, that would help them forward in any country. This would state the case that the client did not pay for the drawings, and if he changed his mind during the course of the erection of the building, he would have no right to get the drawings from the architect. In their German charges they had a phrase to the effect that the drawings did not belong to the client but were the property of the architect, but it was stated that the client must be provided with a set of copies of the drawings if he desired to have it. That clearly showed that the original drawings belonged to the architect, but at the same time he took it that they would have difficulties in any law case over the point. Therefore, he would like that International Congress to give its opinion that an architect was only paid for the actual carrying out of the building as a work of art, and that the drawings had nothing to do with the design, and were the property of the architect himself.

Mr. Middleton said he would like to move an amendment. He was very sorry to find himself in opposition to Mr. Statham on the matter, because he thought that generally on the whole ground he was in the right, but further than that, he thought if the resolution was carried it could not be carried out until architecture, like the law of medicine, was a definitely legalised profession; which was a course of policy on which Mr. Statham and he differed. There was another question as to the scale of charges of the Institute being made a portion of the law—that was not only this portion of the scale of charges but the whole of it. He felt that if the scale of charges was once taken into the House of Commons they would find that Parliament would consider it from the point of view of the public, and not from the point of view of the architects, and they would prevent architects charging too much as against the public. That would certainly not make a scale in favour of architects. They would make the present scale a maximum scale, while now it was the minimum scale, and they would probably get just the reverse of what they wanted. He felt that a legal scale would be very harmful to architects. The only profession which had a legal scale was the law, and that scale was forced upon the lawyers to prevent them from robbing the public. The scale was not given to the legal profession to enable them to obtain their charges, but to prevent them from overcharging. He felt that this was the view that Parliament would take in regard to architects' charges, and he moved as an amendment:—"That in the opinion of this meeting the Royal Institute of British Architects should revise the wording of its paper on the professional practice as to the charges of architects in the sense indicated above." He thought the resolution should stop there. That would do away with the question of forcing it on the House of Commons or the House of Lords as matter of law, and would only be asking the Royal Institute of British Architects to revise its scale. That scale was very well accepted as the general custom when cases came before the courts at the present time, and if they altered it in the sense indicated, he thought it would become very generally recognised.

Mr. Prentice, in seconding the amendment, said he fully believed with the last speaker that if the matter was brought before Parliament an endeavour would be made to make the scale of charges and the ownership of drawings in the interests of the public rather than in the interests of the architects. He was a delegate from Tasmania, and in that country they felt very keenly upon this subject. He might say that in conversation with one of the vice-presidents of the Royal Institute of Victorian Architects before he left, the desire was expressed that everything possible should be done so far as the legalising of the retention of drawings by the architect was concerned. In the old scale of charges they had a clause which definitely set out the minimum charge of 5 per cent., and it was stated that all drawings prepared by the architect should remain the property of the architect, and were simply to be used for that particular work. Now, in spite of that he had had clients who had really claimed the drawings, and more particularly of works which had not been carried out, and he had felt that it was so problematical whether or not the law would support what was stated on the printed matter placed before the client with the charges that he had never felt disposed to fight it in a court of law. On one occasion he was compelled to give up the working drawings, but in other cases he had endeavoured to appease the client by giving him such tracings as would meet the requirements of the case. Under those circumstances he thought it would be a wiser course to follow the amendment, and let the Institute so alter the wording of its paper, rather than to take it to Parliament, where he was afraid they would have a verdict against them.

Mr. A. H. Kersey said that he had another amendment in his mind, but he thought they were losing sight of the nature of that meeting. This was an International Congress, and as Dr. Muthesius had suggested, they ought to consider the matter from an international point of view. Mr. Statham's resolution was one distinctly affecting English architects only, but he (the speaker) asked the Congress to follow rather the suggestion of Dr. Muthesius. The English architects were quite capable of passing a resolution themselves with regard to what they wanted, but what was required was for the Congress to give a sign manual that the architect's drawings were his own, and that the architect was not merely a workman for providing so many sheets of paper, but was a man for producing an architectural building. It had been pointed out there and elsewhere that the architect had to spend laborious hours and much money, and have the natural gift, before he could do this. He would read the resolution he intended to move, and then if it was carried Mr. Statham would no doubt move that the Institute should do what was wished. He proposed:—"That this Congress is of opinion that the architect is paid for the production of a building, and that the drawings and paper prepared by him to that end are undoubtedly the property of the architect, and that this is the universal practice in other countries." He proposed that, but would be prepared to accept any alterations which would carry out the object they had in view.

Mr. Middleton appealed to Mr. Statham to withdraw his resolution in favour of that of Mr. Kersey, and then he would withdraw his amendment.

Mr. Hudson asked if Mr. Kersey would substitute the words "should be" for "are undoubtedly the property." There was no doubt at present the judges were against them.

Mr. Kersey said he was speaking universally, but he was quite prepared to accept the suggestion. His only desire was to get a strong resolution by the Congress which would show the English people that they were the only country where the architect was not entitled to retain his drawings.

Mr. Statham said he would withdraw his resolution, and Mr. Middleton then withdrew his amendment.

Mr. Read suggested that they might get the foreign delegates to say what the law was in their countries, so that they might have the weight required in the resolution.

Mr. Kersey moved his suggested amendment as a resolution.

Mr. Berry, in seconding the resolution, said he was very glad that it had been substituted for the original one. He quite agreed in sentiment and theory with all that Mr. Statham had stated, but they had a very much sterner law than theory and sentiment, and the law had laid it down emphatically that they had not the right to the ownership of their drawings. It was no use them standing there and saying what they wished, or what they believed, or what they liked. They were in the position of the men in the stocks, and must get out as best they could. He thought the resolution proposed by Mr. Kersey was an excellent one, as it would enable them to express what they would like without fighting against the laws that be. He took that opportunity of deprecating most strongly any attempt to alter or tamper in any way with their existing schedule of charges of the Institute until the law was amended. That schedule of charges was now used as their sheet anchor in this matter. It was the only ground upon which they could stand, and they had always based their contention with regard to charges upon the fact that it was the custom. They had no stronger ground, and that schedule of charges showed their custom. Immediately they began to tamper with it and turn it about they lost the value of that plea of custom, and he thought it would be a most dangerous precedent. They had for many years past recognised the fact that they had no ground to stand upon in claiming the ownership of drawings. They used to have on their schedule of charges a footnote stating that it was not law but it was the custom. They were advised to withdraw that note because it was misleading their professional members, and it was withdrawn accordingly. That was a very significant fact. The profession recognised that under the law as at present they were not entitled to the ownership of drawings, and it was no use their attempting to enforce it. Mr. Statham had made some remarks deprecating the inaction of the Royal Institute of British Architects in the case of Gibbon *v.* Pease. He (the speaker) contended that the Institute were perfectly justified in the course they pursued, for if they had taken the matter further they would have landed themselves in a great deal of expense for nothing at all. He had much pleasure in supporting the resolution, and trusted it would get such unanimous support for it as would show not only the feeling of architects in this country, but in all other countries.

Mr. E. W. Fritchley (India) asked to be allowed to say a word from the point of view of the client. It was, he thought, well to put themselves in the client's position, and see how the thing affected him. An architect might have put up a building for the client, and at some future time the client might want to make an extension of the building. Well, the architect who had prepared the original drawings might have died, or he and the client might have fallen out over the building of the first building, and the client might not want to retain him again. It did seem rather hard upon the client that he should have to break away portions of the construction in order to find out what the construction was like, which he might have to do if the architect retained the drawings. Therefore he would suggest some alteration of the resolution to the following effect: "That all drawings shall be the property of the architect except such constructional drawings as are necessary to give an idea of the original construction."

Mr. Statham said it was perfectly open for the architect to give copies of these drawings without parting with the originals.

Mr. Kersey said it was almost a universal practice with London architects when a job was finished to supply the client with a drawing which gave him all the details he wanted to know, such as the positions of the drains, bells, hot water and other pipes, and all information which was likely to be required to prevent the pulling about of the building.

M. Harmand pointed out that it would be a most dangerous thing for them to say that they were paid for putting up a building, for the natural question would be, if they did not build, "What are you going to be paid for?" He thought they would all agree that the drawings should be the property of the architect, but he thought that they ought first to deal with the question of copyright, and then come back to this matter.

The Chairman, in reply to M. Harmand said the opinion of the members present seemed to be in favour of the separation of the two questions, and the discussion must be confined to the ownership of drawings.

Dr. Muthesius said he hardly liked the wording of the proposition saying that this was the universal practice in other countries. In the first place it made it a purely English matter, whereas they wanted to make it an international question, and in the second place it was not quite true.

Mr. Kersey said he would delete the last words of the resolution.

Mr. Hudson suggested that the resolution should read: "That in the opinion of this meeting the architect is paid for the building or for the opportunity of building, etc."

Mr. Kersey said if that were done the client would certainly claim the drawings. The lawyer would arrive at once to the conclusion that the client should have the drawings.

The Chairman read the amended resolution as follows:—"That this Congress is of opinion that the architect is employed for the production of a building, and that all drawings and papers prepared by him to that end are undoubtedly his property."

Mr. Fritchley said that according to this wording the client would not be entitled to any drawings, and his clients would greatly object to that.

The Chairman pointed out that Mr. Kersey had explained that the usual practice was to supply drawings showing the location of the drains and wires and so on.

The resolution was then carried and the Congress adjourned.

On Wednesday afternoon visits were made to Buckingham Palace Gardens and Westminster Abbey; and subsequently to Messrs. Holloway's and Messrs. Doulton's Works, the two latter being alternative visits, arranged for the same hours.

The Conservation of National Monuments.

M. E. V. Dahlerup (Denmark) presided at the Rooms of the Institute in the evening, when the subject of "The Responsibilities of a Government in the Conservation of National Monuments" was discussed.

Before the commencement of the discussion Commendatore Alfredi d'Andrade, on behalf of the Italian Government, presented a number of books to the Royal Institute of British Architects dealing with the conservation of ancient monuments, and described some of the methods of conservation adopted by the Government.

Mr. Alex. Graham, on behalf of the Royal Institute of British Architects, offered sincere thanks to the delegates of the Italian Government for the valuable publications, and said he only wished that in the near future the British Government might follow the excellent example of the Italian Government. He also thanked Commendatore d'Andrade for his excellent explanation.

Commendatore d'Andrade said that if the Congress wanted any further information as to the way of his Government in preserving monuments he was always at their disposal.

Government Action on the Continent in the Interests of National Monuments.

Prof. G. Baldwin Brown, M.A., read the first paper. He said that the question of the proper treatment of ancient monuments has engaged the attention in previous years of the International Congress of Architects, and at the last meeting, held at Madrid in 1904, various resolutions were passed on the subject, one of which was to the effect that "a society for the preservation of historical and artistic monuments should be established in every country," and that all such societies "might be grouped for common effort and collaborate in the compilation of a general inventory of national and local treasures." It is the aim of the paper to give a succinct account of the measures actually in force on the Continent for the furtherance of the cause of monument protection, with a view more particularly to advance the cause in Great Britain and Ireland.

The buildings and works of art that have come down to us as a legacy from the past represent national assets which can never be increased, and the problem how best to deal with them is the same in all European countries, though it has been approached, grappled with, or evaded in different fashions. A knowledge of the principles and practice that obtain abroad must necessarily be of value to those interested in this question in our own country.

A comparison of British arrangements for the safeguarding of ancient monuments with those that exist in Continental countries gives the following results. Almost everywhere abroad the initiative has in this department been taken by Governments, while in Britain private individuals and societies have practically done all the work. The British Ancient Monuments Protection Act of 1882, though actually passed as a Government measure, had been due to private initiative. More recently, however, there have been encouraging signs that British Governments are coming to recognise this protection as a suitable matter for State care, and the Ancient Monuments Protection Amendment Act of 1900 represents a distinct advance.

Continental Governments have expressed their solicitude on this matter in various fashions, the most common and one of the most effective of which has been the establishment of State Commissions charged with the upkeep of national treasures of architecture and art. Some of these commissions have been at work for the best part of a century, while others, as in Holland, have only recently been appointed. They exist in at least a score of European countries. Apart from the maintenance of State Commissions, Continental Governments have shown their care for monuments by issuing numerous rescripts, royal and ministerial, some of which date back to the seventeenth century. The Prussian and other German Governments have been especially active in this department, and about fifty Prussian rescripts of the kind were promulgated between 1815 and 1881.

In most cases these rescripts, and the regulations issued by the State Commissions, have not possessed the binding force of law. They have worked well, and been generally obeyed by intelligent and docile citizens, but have not possessed the power of actually controlling the recalcitrant. The formal Monument Act, with its penal sanctions, is something different and more cogent. Such Monument Acts exist in more than a dozen European States, and Great Britain is one of these. British legislation differs, however, from that of other countries in that it confers no compulsory powers over monuments in private or corporate ownership. In the case of all other Monument Acts the proper authorities are given the power to expropriate, on grounds of public utility, any ancient monument of great value that is in danger under its existing ownership. The British Act has no compulsory clause of the kind, and only contemplates a friendly contract between private owners and the public authorities. The contract is voluntary, though while it is in operation the law enforces its provisions.

The work of Continental Monument Commissions, whether or not this is carried on under a formal Monument Act, is generally based on a list or schedule of national monuments which are worth preservation either on artistic or on historical grounds. This implies a process of inventorisation. Such a survey of the national assets in this department is in progress in almost all European countries, and here again Great Britain is conspicuously behind her sister nations. In our own country there is a precedent for State action of the kind in the Department of Historical Manuscripts, on the cataloguing of which a Royal Commission has been at work since 1869. Nothing of the kind has yet been attempted for works of art and historic buildings. There is, however, a growing demand for some State action of this kind in the British Islands; and it is suggested that the International Congress should strengthen the hands of those who are working in this direction by a memorial in favour of a Government scheme for the survey and inventorisation of the vast treasures in ancient monuments and works of art which this country possesses, and for which there is practically no legal protection. It is generally acknowledged that the British Government owes something in this department to the country, and the appointment of a Royal Commission for the purposes just indicated would be the most practical measure that could be adopted.

M. A. Besnard (architect, Paris) followed with a paper, of which the following is an abstract:—

For a long time past the question of the preservation of national monuments has occupied the minds of enlightened persons. In fact, the Congresses of Architecture, of the public arts, or of archæology, which have succeeded one another for some years past, have been called upon to discuss this important problem without, however, up to the present any palpable result having been obtained.

On the other hand, the efforts made on various sides by the Governments show their benevolent solicitude, but they prove at the same time the necessity of having recourse to a uniform programme, the elements of which it is necessary to find out.

It is with this object in view that we have made a list of the different measures which in our opinion should contribute in the most useful manner to obtain this result, and we submit it to the judgment of the Congress.

First of all, it is absolutely important that the Governments should have the power to bring about the obligatory expropriation in every case where a monument which presents an historic, artistic, or archæological interest shall not be kept in proper repair by its owner.

That never, unless it be absolutely and immediately needed, should administrations be allowed to carry out, or to authorise private persons to carry out, works which may cause the disappearance or the ruin of a monument the historic or monumental interest of which is recognised by all.

That everywhere where the site shall form the natural frame of the monument it shall be prohibited to touch it in any way whatever.

That in the formation of streets and sewers the administrations shall be bound to respect the ancient monuments which happen to stand in the line of the laying-out plan, and that in certain cases these monuments shall be made the basis of such laying-out plans.

That in case it should be found absolutely impossible to preserve a monument, it shall be the duty of the administrations, before any demolition work be started, to take photographs, and make faithful abstracts and casts to be deposited in the local museums, and that the fragments of architecture, sculpture, and locksmith's work coming from the demolition of such monuments be distributed among the local or regional museums.

That particular instructions shall be issued as to the mode of proceeding in these demolitions.

That encouragement shall be given to such municipalities to suppress any parasitic structures which hide from view the monuments of the past.

That, wherever it is possible, the monuments shall be preserved for their original purpose, and that for the others measures of hygiene and salubrity shall be taken which will allow them to be utilised. A considerable number of old houses which are interesting from a monumental point of view could thus be preserved to posterity.

That at no time shall the municipalities be authorised to entrust with such work agents of the local public service, but always architects appointed by the Government.

That in the case of enlarging a town the public authorities shall be obliged to preserve its primitive aspect in the main outlines, and thus make it possible to perpetuate its original character.

That advertising shall be strictly prohibited on and around the monuments.

That archæological inventories made on a uniform plan shall be compiled everywhere, so as to secure the perfect and complete knowledge of all the national art treasures.

That in cases where the credits will not allow the immediate execution of the work of restoration of the monuments, measures of protection shall be imposed (particularly with regard to sculptures); and, as a first consequence, that in all buildings devoted to religious services the tumular flagstones shall everywhere be taken up and placed against the internal walls of the buildings.

That in the case of restoration, instructions based on a standard programme, shall be the rule for the architects appointed to carry them out. Among these rules we would mention especially the obligation of preserving to each monument, for all the parts to be restored, records of the previous state. To use (in all cases where this will be possible) the original materials, and to respect the dispositions of the ground plan, these dispositions being elements of the characteristic features of the different styles.

That previous to any restoration a very accurate report on a large scale of the actual condition shall be taken, with casts of the sculptures and the most characteristic profiles.

That general rules shall be established for the placing, the maintenance, and the restoration of painted glass windows.

As the mission of the Government is not only to think of the present, but also and above all to make preparations for the future, they must try to surround with a sentiment of art their programmes for the general instruction of the masses, so that there may be created in the latter a respect for monuments of which at present they are too often devoid. To take one instance, we should see that good reproductions of the masterpieces of monumental art have their place among the list of scholastic pictures, and that in the large towns museums of casts be established on the lines of our admirable museum in the Trocadero.

The Governments should encourage with the greatest care the public and private schools of apprenticeship in order to preserve the taste and skill of the workman and the artisan, without which the work of the architect could never become perfect.

The Governments should also encourage the private societies which have for their purpose the preservation and the defence of monuments, especially by granting them privileges which will enable them to usefully carry out their mission.

They should also encourage the publication and the diffusion of private monographs, such as the one in France entitled *The Church of Our Lady, Cathedral of Amiens*, by G. Durand

published under the auspices of the Society of Antiquaries in Picardy; also those treating of the local influences, such as the *Religious Architecture in the Ancient Diocese of Soissons in the Eleventh and Twelfth Centuries*, by Lefèvre Pontalis; and finally those of collective documents such as the *Collection of the Archives of the Commission for Historical Monuments*, published uner the patronage of the Administration of Fine Arts, by MM. de Baudot and Perrault-Dabot, which contains no fewer than twelve thousand documents, and the interest of which, being admitted by everybody, forms a collection of the very greatest importance.

Professor W. R. Lethaby then read a paper on the subject. He said that the systematic study of ancient art has led to the perfecting of a second method of research, the history of civilisation by its monuments—and at the same time a conscious love of old works of art has been awakened. These, the poetic and historical aspects of old buildings, are dependent upon their authenticity. Such monuments are not mere records; they are survivals, while they preserve the handiwork of the men of old. On the historic side nothing else is a valid document, and on the side of feeling nothing else can touch our imagination.

While the science of archæology was being being built up experts were betrayed by their knowledge and enthusiasm. They did not think of the difference between the mere form of an old monument and the living building itself. Even when they did not make all new they refused to see how they wounded the old by placing their conjectures by the side of it. Restorers acknowledge that harm was done in the past, and then with professions of sympathy they go and do likewise, taking the new word "repair" in place of the old word "restoration," but with similar result.

Renewal is going forward with quickened rate all over Europe, and the most ancient and beautiful buildings are those which are passed through the mill of restoration and left desolate. St. Front, Perigueux, excited so much interest that it was made over again. The Dom at Aachen is being covered up with fashionable marbles and mosaics; Murano Cathedral looks as if it had been supplied from a factory, and so with many others.

In every country protests have been made—in France lately by Emile Hovelaque, in Germany by Strzygowski, in Italy by Boni, in England by Ruskin and Morris—but the custodians of ancient buildings and their architects make a few verbal concessions and go smiling on their way.

The alternative to this method of dealing with old buildings is persistent care and repair, as of national treasure to be guarded. As fragmentary works in a museum seem all the more precious for showing a history of antiquity and loss, so it is with an old building; and if it be cared for in this spirit of proud guardianship no necessary strengthening and upholding will harm it.

It is usual to object that old buildings are not in museums, and have to be maintained for use; but no proper use is hurtful. The use and stability of our cathedrals have been sacrificed to the caprices of ornamental decoration. If the principle is accepted that our object is the preservation of the integrity and authenticity of a monument, we can hardly go wrong in carrying out needful repairs. Much experience is stored up in the papers issued by the Society for the Protection of Ancient Buildings.

If architects must restore, let them do it on paper only, without impairing the evidence of the building itself, evidence which disappears when they actually build their theories, so that we have not even the satisfaction of being able to prove them wrong.

We can hardly go to any famous building in Europe without finding extensive works in progress and unless there is soon some great change of policy there will be little left that is truly old to hand on to posterity.

M. Joseph Artigas y Ramonella (Barcelona) also read a paper. His conclusion was—

From my determining the "nature of national monuments," deciding "to whom they belong," and fixing the "advantages of their conservation," it follows logically that the only way of preserving them is incumbent on peoples and Governments, on the latter resting principally the sole responsibility for their loss, for the reason that they alone have the active authority to avoid it, and the charge of the necessary public moneys to preserve them from the natural decay which the parts must suffer both through the action of time and from the destructive hand of man.

The following is a summary of the essay presented by the Tuscan College of Engineers and Architects—

The late engineer and architect, Professor Giuseppe Poggi, of Florence, Honorary President of the Tuscan College of Engineers and Architects, and *Correspondent* of the Royal Institute of British Architects, in some memoranda and articles which are now being collected by his family into a single volume, together with other documenfs concerning art, on several occasions expressed his views with regard to the responsibility of the Government for the preservation of national monuments. This College now submits to the Seventh International Congress of Architects in London the extract from the volume bearing on this subject, which has been presented by the family, together with an epitome of the opinions expressed by a person of such universally recognised authority.

As early as 1845 Professor Poggi had written a paper "Concerning the Respect which we owe to the Antique Monuments," and in 1864, in a memorandum read at the Royal Academy of the Friends of Geography, "On the Project of Expropriation with a view to the Preservation of the Monuments," he summed up his impressions about the law presented in the Italian Parliament, concluding with these words: "The spirit of that Government is provident which intends by the means of expropriation to secure the preservation of the monuments of art and of natural history which are of an immovable character, and the preservation of which would be in danger if they continued to remain in the possession of private individuals or of corporations.

"In our opinion, such a wide and generic law cannot be productive of the beneficent effects which it is intended to achieve, by reason of its own excessive vastness, because neither the State nor the communes could support the immense expense which the wide application of the law would entail.

"In order to obtain the desired results it would, in our opinion, be convenient that the law should be assisted by preventive measures and by arrangements which would render its application less frequent.

"Among these arrangements we should consider the following to be of great efficiency:

"1. The compiling of an illustrative list which would indicate those monuments of national interest, compiling it with so much discretion as not to register without good reasons any except those immovable monuments which are really worth preservation.

"2. To make appeal to the citizens and corporations, owners of such immovable objects of art, with a view to revive in them the ancient sentiment of the beautiful and to encourage them to make the necessary sacrifices; further, to animate the whole nation and the municipalities with a sense of gratitude and esteem towards those who fulfil such a noble and patriotic duty.

"3. In those cases where this appeal should remain of no effect, it would be necessary, with regard to immovable monuments of practical usefulness, to order the restoration within a given period, and in case of failure to have it done by the commune at the expense of the owner. Should this appear to be too harsh, the property should be expropriated and sold by public auction with the prescriptions adapted to the case. For those private properties used for religious purposes, the patronage should be ceded to families who would undertake to keep them in proper repair. In the case of those properties used for religious purposes and belonging to corporations, orders should be given for their restoration or their keeping in repair, and should they be too poor to do it, expropriation should not be declared unless there is a certainty of a better preservation. Finally, for those which are neither among the number of the properties put to a private use nor among those used for religious purposes, it might, in the case of bad preservation, be convenient to declare for them only the permanent expropriation, this course, for the reasons indicated, not being a burden either to the State or to the communes.

"4. In conclusion, to form a fund, not so much for the purchase of immovable monuments which may come under the law of expropriation for permanent preservation, as for the purpose of covering the losses on the price of those which must be sold at once by public auction, and to furnish the funds for the necessary repairs."

In another memorandum, read at the second Congress of Engineers and Architects in Florence in the year 1875, bearing the heading, "On the Preservation of the Monuments of Art and Archæology," at the time when it was proposed that the Government should lose no time in passing a law for such preservation, Professor Poggi set forth his conclusions as follows:—

(*a*) That it would be necessary to render it obligatory, in cases of important restorations of national monuments, to obtain the previous decision of the consulting provincial commissions.

(*b*) That the monuments belonging to private individuals should be submitted to the same law of preservation, adopting the course which shall be deemed most convenient. In any case it should be ruled that the private monuments should form part of the general inventory of the monuments of the nation.

(*c*) Before the consulting provincial commissions enter upon their duties, the foundation and the principal evidence for the preservation and restoration of the architectural monuments in question, and for the formation of the inventories of those which must be declared to be of national interest, should first be discussed and established by architects and other artists, as well as by archæologists and other competent persons. These inventories should be accompanied by the plans, sections, and perspective views considered necessary to give a clear idea of the present state of the monument, and of the necessity of its restoration and preservation.

(*d*) Appeal should be made to the Government itself, with a view to steps being taken to constitute a fund or a revenue which will furnish the means for carrying out and observing the law in a convenient manner, either by the Treasury making return of such part which it might have unlawfully appropriated and which was to be used for the preservation of works and monuments of art, or by issuing such measures as will be considered most to the point. And there being among these measures that of the entrance fee for visiting the museums, art galleries, antique monuments, &c., it is to be hoped that the receipts therefrom will be entirely destined for the above purpose.

On later occasions Professor Poggi expressed the view that the means at disposal should be put into operation at once for the restoration and the preservation of the large number of architectonic monuments which suffer, and the importance of which becomes known on the occasions when new excavations are opened and when searches are made for remains of Etruscan, Greek, and Roman monuments.

"Italy," he wrote, "is already recognised by the whole world as a great country on account of her numerous and varied monuments which have been uncovered. It is not urgent to excavate the buried remains, because in the state of preservation they are in now they will be found unaltered in a couple of centuries; but we cannot say the same of those which are visible objects of admiration and of study, and of which it behoves us to arrest the decay without delay, unless we are to see them pass away from us for ever."

A paper by M. Gaston Trélat (Paris) was taken as read. His summary and conclusion were as follows:—

If the State is a chief synthesis of collective interests the Government is the effective agent of the measures which these interests demand.

Now, monuments are important elements of national beauty. As such they form part of the preoccupations which in our days *public art* would tend to claim and bring within its compass.

This new institution has already taken a place in Parliamentary deliberations with regard to the preservation of sites; and finally Governments have no longer the right to be indifferent to it. National monuments are important elements of public beauty. They have, therefore, a conspicuous place, with this inherent and distinctive feature, that they were included in the former classification of the Fine Arts.

If Governments should be indifferent to their preservation and maintenance, it would be going against the great fact which becomes more and more evident and which takes a character of social progression, to at least honour our time.

Conclusion.—Monuments are a source of public beauty, and their preservation ought to

be submitted to the deliberations of competent persons representing the collectivities interested. Consequently it involves in the highest degree the responsibility of Governments.

To facilitate the double operation, as well as to effectively instruct the public as to the results expected, there is reason to desire that, whenever it is shown to be useful, the custom of making temporary models before any definite execution should be extended.

M. Besnard moved :—"That the Government should be empowered whenever a case arises to expropriate a monument which is historical."

Commendatore d'Andrade seconded the motion.

Mr. W. D. Caröe said this was a very general resolution, and there could be no objection to it. If a monument was in bad hands and likely to be destroyed, somebody should step in and save it. Therefore he was very ready to support the proposition.

The resolution was carried.

Mr. Alex. Graham moved :—"That this International Congress of Architects recommend that the British Government be approached with a view to appointing a Royal Commission to control and to extend the operations of the Ancient Monuments Protection Amendment Act of 1900, and to prepare an accurate catalogue of the ancient monuments of the British Islands, taking similar action to that of the Department of Ancient Manuscripts and in agreement with the measures adopted in other countries."

M. Besnard raised the question of what was an ancient monument ?

Mr. W. D. Caröe said he had great pleasure in supporting the resolution, but would ask Mr. Graham to accept a slight modification. A gentleman had been discussing what was an ancient monument, and as a matter of fact in England they were rather disposed to consider that an ancient monument belonged to the prehistoric period, and, therefore, in the resolution it was very necessary that they should make it clear that they included not only prehistoric monuments, but also historic monuments, and he suggested that the resolution should read :—"And prepare an accurate catalogue of all ancient monuments in the British Islands, whether historic or prehistoric."

Mr. Graham said he would accept that.

Mr. Caröe said they were told, as Professor Lethaby had said, that their ancient monuments were being destroyed, and really the first thing they had to do before handing over their monuments to the Government was to educate the Government. Upon that point he must express himself frankly, and his feelings were entirely with Professor Lethaby when he said that so far on the Continent—and he begged the pardon of their visitors if he said anything that they might feel harsh—the result of placing monuments under Government had been disastrous. It had not been intentionally so, but he felt it had been actually so. Therefore, in seconding the resolution, which he believed was a necessary one, he felt they ought to act with caution and that their friends from across the seas should think with them a little as to what they felt in the result of the restorations which had been going on in Europe. It was very easy to give cases, and perhaps he might give one instance of a case of restoration taking place in the Chairman's own country. When he was a small boy of six or seven he was interested in ancient monuments, and he was travelling in Zetland and came to a little village where he saw the first round church he had ever seen. He did not know whether he was more interested in the storks than in the church, but at least he recollected the church. He visited the place for the first time since about two years ago, and before going there he drew a picture of the church as he remembered it as a little boy. He drew the tower, but when he got there his wife chaffed him and told him he could not rely on his memory, for the church had no tower. Well, they got hold of the old verger, and he told them that the tower was pulled down because the church belonged to the XIth or XIIth century, and the tower belonged to the XVth century. That was an excellent example of the kind of restoration which had been going on all over Europe. He could give them other instances. He could tell them how he saw some beautiful ancient carvings pulled down because the figures were drawn out of proportion, and an admirable artist put back the same subjects, but in designs which he thought worthy of the XIXth and XXth centuries. That had been going on in many places. After all it was not only the forms of their ancient monuments that it was necessary to preserve if they were to be of value to them, but it was their spirit, and he could conceive no case where the form had been preserved and the spirit lost more completely than that remarkable restoration which had taken place at Carcassonne in Northern France. It seemed to give them everything that restoration ought not to be, and yet Viollet le Duc had produced the most remarkable monograph, which showed his extreme erudition in everything but the spirit of the Gothic architecture, which he did not understand in the least, and had wiped out of the city. He hoped that Professor Lethaby's paper would be translated into the various languages of those attending the Congress, and although they might not agree with it *in toto* (and he did not himself, because he felt in some cases it went a little too far), yet he trusted it would be read, marked, and digested, and considered bytheir friends across the seas.

Professor Baldwin Brown said that in supporting the resolution he thought they should not confuse the issue by saying too much about this great question of restoration. It really did not depend upon the action of the Government. They had committed the sins which Mr. Carol had spoken about in England just as they were committed all over Europe. The present aspect of Salisbury front was as bad as that of Carcassonne or of the interior of Notre Dame. What they wanted to do was to educate the public who were not official, and they had also to educate those who were in official charge. He agreed very largely on what had been said as to restorations, although not to the full extent enunciated by Professor Lethaby in his paper. He did not mention the question of restoration in his paper, for he thought it stood apart from what they were really dealing with, which was the necessity of some Government care of monuments, and that did not necessarily take the form of restoration.

Com. d'Andrade and M. Besnard spoke in favour of passing a resolution in more general terms.

Mr. Carol pointed out that they had already passed a general resolution, and they wanted this particular one to apply to the country in which the Congress was being held.

After some further conversation,

Professor Baldwin Brown said there appeared to be some feeling that the motion was not international enough because it concerned the British Government. He thought it was international, for the International Congress asked the British Government to fall into line with other countries. That he thought was an international matter, and was a demand which such a conference might make to one nation which was out of line with others. It was a matter which affected the whole community, that all nations should be engaged in the common work of caring for these monuments.

Further discussion took place on the question of enlarging the scope of the resolution, but no amendment was moved, and it was carried.

A vote of thanks to the Chairman, on the proposition of Mr. A. Graham, concluded the sitting.

How Far Should the Architect Receive the Theoretical and Practical Training of the Craftsman ?

On Wednesday morning at the Grafton Galleries papers on this subject were read and considered. The chairmen were Herr Otto Wagner, of Austria, and Mr. R. S. Balfour, of England. The secretaries were Mr. H. O. Tarbolton, Scotland, and M. Gustave Wickman, Sweden.

Mr. Balfour, in opening the proceedings, said he proposed to call on the various gentlemen to read their papers, and any resolution that might be proposed would come at the end of the discussion.

Herr Wagner also made a few opening remarks, and gave the conference a cordial invitation to make Vienna the next place of meeting.

Architecture and Craftsmanship.

Mr. Reginald Blomfield, R.A., read a paper on this subject, the following being the abstract :

Object.—To ascertain how far craftsmanship is necessary to an architect : (1) by tracing the development of the idea of the architect craftsman ; (2) by consideration of the function of architecture.

The practice of the earlier Renaissance, specialisation of the architect. Draughtsmen's designs at end of eighteenth century. Loss of tradition. Sham mediævalism. The last stand of classic. The great exhibition of 1851. The pre-Raphaelite brotherhood not a purely artistic movement. Their idea of reforming architecture by the study of nature. Mr. Ruskin. William Morris : his view of architecture, his passion for craftsmanship ; his hatred of classic. The Arts and Crafts Society : the value of its work in regard to the minor arts : neglect of architecture. The pre-Raphaelites and their successors conceived of architecture not as the art of building, but as the ornamentation of buildings.

The Province of Architecture.—Buildings the only "nature" it can study. Its appeal by disciplined design, its analogy with music, space composition. The architectonic art. This view repudiated by Morris. The anarchy among the crafts ; and l'Art Nouveau, the result of the withdrawal of the crafts from the control of architecture. Need of thorough training in technique for architectural students. Need for architects to resist the tendency to disregard architecture and absorb it in the crafts.

The Relation of Modern Architecture to Craftsmanship.

Professor W. R. Lethaby also contributed a paper, of which we give the following abstract :

The practice of modern architectural design is based on custom. In some countries there seems to be a more general agreement than in others, and in the former there is a nearer approach to the existence of style. Beyond this what are the possibilities by which modern architecture may enter on a course of development, and how can we attain to reality in building ?

The styles of the past were shaped by a growing mastery of craftsmanship, and only this will produce art akin to the old, an art which is discovered rather than willed. The architect's store of forms is for the most part degraded memories of the discoveries made by ancient craftsmen. Whence is new energy in modern architecture to be derived ? In part it may come from the investigations of science, but even so it will require a resourceful craftsmanship to deal with the new material.

At present the architectural profession is isolated from workmanship, and is thus imprisoned within a small sphere of ideas. Architects have aimed at bringing back the *appearance* of masterly craftsmanship, but this outward appearance has no vitalising force.

A closer contact with labour may mean at least three things. We need, first, to be in closer touch with the executants of our buildings, and to be anxious to learn from them what they think is good work. In the second place, it may mean the acceptance by the scientifically trained directing architect of more help from independent workmen of a high order, painters, sculptors, metal-workers, modellers, and the like, while giving up the commonplaces of office-designed ornament. And, thirdly, it may mean the practical training of architects themselves. This idea is liable to two misconceptions, as if it were proposed that the architect engaged on important work should make his own mortar, or as if the claim might be satisfied by receiving lessons in enamelling or wood-carving. The crafts essential to an architect, of course, are masonry and carpentry, while they remain the principal factors in construction, and so understood, craftsmanship should form the basis of architectural education. The student should cut stone, frame up wood, and handle bricks. Often, of course, he could not afford much time for this, but even a month's practice with materials and tools would be better than nothing.

A short course should form part of the education of all students, but some would probably become much more interested in this side of things, and could follow it out further. Thus we might train architects of varying capacities for various requirements. It is the mistake of all systems to form men of one pattern. However desirable it may be to train some men to the highest degree of academical skill, these are best fitted to deal with the complicated problems of practice in a big city, while the humbler works of the country require equal devotion, but of a different kind. A basis of craftsmanship in architectural education should open out channels for diversities of gifts which may correspond with the diversities of requirement.

M. Fr. Van Gobbelschroy read a paper on behalf of the Central Society of Architecture of Belgium—

The importance of the mandate of the

architect is great, because it expects from him extensive knowledge, without which the artist cannot consider himself to be at the height of his mission.

The great drawback the profession suffers from is due to the fact that the title of Architect may be assumed by persons who have neither obtained a diploma nor received a special education, and that this unjustifiable tolerance places in the hands of inexperienced persons an art which they will never be able to understand, and still less to practise.

All who desire to make serious study of architecture should be made to acquire the large amount of indispensable knowledge necessary to enable him to carry out a project.

The education should be more complete, because to the art of making ingenious plans the architect must add not only the qualities required to have them carried out as a whole, but also those which the contractor and his sub-agents must possess.

The architect must be able to judge, as a real expert, of the most minute details of the construction—in a word, he should possess the technical knowledge of all the trades which he employs, and this to the extent of being in a position to discover, and to have put right without hesitation, any part of the work badly done. And in the presence of this vast knowledge, which one should expect him to possess, there is no doubt that the architect would recover the prestige he always used to exercise in the building industry.

Besides, it must be stated that this perfect knowledge of the technical part of the crafts which we ask the architect to possess is not an innovation. In fact many architects of the Middle Ages, and men of science, such as Galileo, Newton, Leibnitz, Stephenson, and others, were, at the same time, manual labourers. They knew how to manipulate matter in order to put their ideas into practice.

Of course it is not necessary that the technical knowledge of the architect should enable him to perfectly handle the tools of all the crafts—this would be useless; but it is necessary that his knowledge should enable him to carry out everything in accordance with the rules of art; and for this purpose it is necessary that he should himself, within the limits of possibility, have practised under the eye of an experienced master all the kinds of work which later on he will have to carry out in his projects.

Besides, this practical knowledge will enable him, with the aid of the superior education he has received, to contribute to a rational and practical improvement of the methods of execution adopted, and it will have not only a direct effect upon his authority, as we have already said, but also on the interests of the proprietors, of the substantial contractors, and of the workmen. For, as one would see disappear, for the honour of the profession, that species of so-called colleague, we should also witness the diminution of the credit of those not over-scrupulous contractors who not only injure the interests of their clients, but who frequently endanger the lives of many workmen.

Thus far is it that the architect—that is to say, the man who surveys buildings in the way of construction according to the rules of art, who makes the plans and estimates—in a word, this is how far the master of the work, as he was so properly called during the Middle Ages, must be an artisan.

To sum up, the architect must be able to work well himself in order to be able to command well.

This education, which would form part of the whole, would not require more than two years of supplementary studies, because it would only be a question to extend in a practical and convenient way a known programme.

The present programme followed for the studies of the architect could remain, with a certain revising, and there would have to be added to it that which is wanting for the training of the artisan.

In imitation of what is being done in Germany and in Austria, we should thus have academies where technical engineers for the building industry would be educated, with the advantage that these special studies would be imposed, not upon manual labourers, but upon individuals who would already have gone through the superior studies of architecture. With our neighbours these studies have for their aim to form technical engineers who have a perfect knowledge of the materials; the students learn there to distinguish between materials of good and of bad quality, and to render to themselves an account of their qualities, in order to be able to make a judicious choice. They study there the handling and the working of the tools used by the workmen and by the contractor; in short, they carry out all the working operations which may occur, making use of all the special tools which have to be used in the finishing of any given work.

The complete school for architectural education which we should like to see created in Belgium would necessitate, as we have already said, the combination of the principles adopted in Germany and in Austria with artistic and scientific education, but basing nevertheless the technical teaching upon that of the English technical schools, which are essentially practical and in which the oral lessons and the manual work are taught by the methods which develop in the pupil the spirit of investigation, determination, and initiative.

This summary does not allow us to enter into details of the programme of the lessons, but it cannot be denied that the result of the elements recommended for adoption in a programme of studies would be, after the lapse of a few years, the decisive element in the ever-growing competition among architects, because it would contribute to make disappear mere routine and empiricism, which put into a real inferiority a large number of our young colleagues.

Being given the superior and practical tendency of the studies at such a school, we are convinced that the young artists, the owners of a diploma for having finished their studies, would have capacities which would be appreciated by the artistic, scientific, and industrial world.

We indulge the hope that our work will contribute some elements to the solution of the very important question as to what extent the architect must be an artisan, and it will have shown the undeniable necessity of a complete education, which must always be kept at the level of progress with a view to the improvement of the career of an architect and the recognition of its value, its rights, and its authority.

Herr Otto Wagner, Imperial and Royal Superintendent of Works, Professor of the Imperial and Royal Academy of the Plastic Arts, read a paper on behalf of the Society of Austrian Architects, the following being the abstract—

Concerning this question we beg to make the following observations:

Reference has repeatedly been made in our previous communications to the scientific education of the architect, and stress has been laid on the fact that he has to learn such a vast amount of facts, and that, for the reasons given in the beginning, this learning cannot embrace everything. In going through the technical studies of the architect, what is required is a good grounding, which will enable him to acquire what is further needed in the course of his subsequent period of activity.

The actual work of the architect, and a number of artistic matters, such as the cultivation of the allied arts of painting and sculpture, the keeping pace with the professional literature, etc., cannot fail to induce him to be very economic with the time he is able to give to these occupations, and moreover he will have to reserve a very considerable part of his time to the supervision of the works to be carried out by him. It will therefore not be wrong to sustain that these matters can hardly receive much attention, from sheer lack of time. To this must be added the loss of time which is caused by the fact that the desire to create and consequently the capacity to create, are faculties which the artist cannot command at all times.

A further accumulation of work by learning one or more trades (to learn them all is utterly out of the question) certainly exceeds that measure of time which the architect has at his disposal to devote to such work. If besides it is taken into consideration that handicraft of the kind in question sometimes requires considerable physical strength, and may therefore be injurious to the steadiness and the fine touch of the hand, it is to be discountenanced to penetrate so far into the manual work of the architect's craftsman. The knowledge how any given part of a building is to be made belongs to the sphere of practice, which the architect will acquire in the course of his career all the more readily because his innate gift of invention will serve him as an auxiliary.

(*Continued on page* 95.)

Illustrations.

COMPETITION DESIGN FOR PEACE PALACE AT THE HAGUE.

IN this design it was considered that, as the large Court of Justice is the *raison d'être* of the whole group of buildings, it should be approached centrally in order to give it dominating importance, and this consideration largely governed the setting out of the plan.

Nor was the schedule of accommodation given considered as being absolutely final in all particulars. Knowing what accommodation in the way of consultation-rooms are considered necessary in connexion with an ordinary Court of Law, it did not seem reasonable to assume that two small rooms would suffice for the use of people having business in the two Courts. For this reason six rooms are shown, and the plan is enlarged.

The reading-rooms, for the same reason, were increased in area, and the hatched portion on the site plan was considered rather as indicating the position of the required buildings than as fixing their size.

It would seem fitting that an aarchitectural monument placed in a park should have façades of almost equal importance, the only difference made is that the principal feature, placed as it is over the hall, gives a greater relative emphasis to the entrance front.

It seemed essential that the buildings should be treated in a somewhat severe classical manner in order to be in keeping with the international character of the building; and that anything suggestive of the architecture of any one particular country would be a mistake.

WILLS & ANDERSON, and H. W. COTMAN, joint architects.

CHURCH OF ST. JOSEPH, BRIDGFORD, NOTTINGHAM.

THIS proposed church is planned with a nave, 28 ft. wide, divided into five bays, with side aisles 5 ft. wide for procession, with seating accommodation for 400. There are also two chapels on the Gospel side, with priests' sacristy and choir sacristy on each side of the sanctuary, and over these the choir and organ chamber with arches opening into same.

The entrances are through the two towers at end of the building.

The presbytery, which adjoins the church, is planned for two priests, with access to sanctuary.

The materials of the construction are to be local stone, with stone face for the Ashlar work and Ketton for the tracery and moulding.

The roof to be covered with Delabole slating. J. H. EASTWOOD.

ADDITIONAL OFFICES FOR THE BOROUGH COUNCIL OF HOLBORN.

THE design, of which we give the elevation and plans, is the one to which the first premium has ben awarded in the competition for additions to the Holborn Municipal Offices.

Messrs. Warwick & Hall, the authors of the design, send us the following summary of their intentions in working it out:

"In preparing the accompanying design, particular importance has been attached to the retention of the present offices with the least possible alteration, so that they may be in use during the carrying-out of the works, and obviate the necessity of the Council acquiring temporary premises elsewhere.

The additional accommodation is provided in as economical a manner as is possible with convenience, and every part of the building is well lit and easily accessible. The work is restricted to one-half of the available site, so that the remainder may be let for future letting purposes, with a frontage to Goldsmith-street of 95 ft. The existing library levels have been followed in the elevation, and the character of the front made to harmonise with the present one. The back elevation is unaltered.

The cost is estimated at 19,205*l.*, this sum being thought adequate to carry out the work in a satisfactory manner, with the exception of any special interior fittings and decoration that may be required."

THE INTERNATIONAL CONGRESS OF ARCHITECTS.

(*Continued from page* 94.)

The question under consideration, Number 6, can therefore be correctly answered in the sense *that the architect must know in a theoretical relation, and with regard to intuition, every trade and the qualities of the materials which he uses in his constructions, but that it is not necessary that he should become proficient in the manual skill belonging to the handicraft.*

M. Gaston Trélat (Paris) also contributed a paper, and the author's summary and conclusion were as follows:—

The theoretical and practical education of artisans can certainly become an abundant source of development in art. But then it must be judiciously led. Otherwise it would have dangers which would soon show themselves in the work produced.

I wish to say at once that it ought to be consistent with the direction which the professional life takes. And this latter entails the general affinity with all the trades which contribute to the execution of the architect's works. From this results a real *theoretical and practical* education, which latter embodies itself in an extension of *conscientiousness* in the artist. Hence a vivacity of spirit which shows itself in the particular character of the elements conducing to the harmony of the *ensemble*, to which they remain subordinate—without which would be exceeded the taste and proportion taught us by a certain *philosophy* drawn from manners of arrangement to which matter is subject. As can be seen it is an education to which one consecrates one's life.

But for that there would be no reason to rely on an initiation from the commencement of life. Before all else, it must endeavour to show the disadvantages of making the different elements that the variety of trades represent dominate too much in a work. For this would expose one to a cause of incongruities which should be avoided in architectural conception and execution. Certain masters, whose memory is surrounded with the respect which is due to them for the harmony of their lives, and certain schools could supply evidence of this, if the thing needed to be supported by material proofs. But this is not the case.

Therefore, in order to prevent confusion in the mind, this education will be carried on by the fact of the career itself. For the architect it will result exclusively from the experience he will gain from all the trades contributing to the execution of his buildings.

Conclusion.—The education of an architect-artisan is sufficiently gained by the routine of a life practically absorbed in the applications of the art.

With regard to a theoretical and practical education at the commencement of the career, the advantages would in no way make up for the time spent; and the disadvantages of it would predominate.

M. Robert Lesage (Paris) gave the following summary of the question—

We thought that under the heading "The Architect-Craftsman" the organisers of the Congress proposed the study of the question of "the professional training" of the architect, of the technical teaching completing the general teaching, and in particular that of the art of architecture.

Our colleague, M. Poupinal, will treat of the history of this question in the Congresses, whilst in this report we shall study a programme or technical teaching of the various building trades.

We shall divide the report into two chapters.—I. The general programme. 2. In particular the programme from the French point of view.

Part I.—The General Programme.

What has been done in Europe.—1. By the State. 2. By private initiative.

In particular, what has been done in France.—For the building trades the State has organised workshops and professional schools in which *workmen only* are trained; it has not yet created any technical school for the training of *chiefs of enterprise, directors of work, contractors, and architects.*

In this direction private enterprise has already produced, enumerating them in chronological order:

The Trélat School.

The courses of lectures of the philotechnic, philomatic, polytechnic and other associations.

The courses of lectures by M. de Baudot at the Trocadéro.

The courses of lectures of the Syndical Chambers.

The School of Public Works.

The school of construction of buildings.

The school of mutual teaching of arts.

The characteristic Features of these Schools and Lectures: Their Insufficiency. Programme of a School of Technical Teaching for Architects and Contractors.

Method of Teaching:

The lessons;

The exercises of application;

The practical works (workshops, laboratories, *visits* to edifices, factories, workshops, building yards).

The courses of lessons would include the study of the work from the point of view of its practical execution, and from the point of view of the settlement of accounts.

The teacher, in the analysis which he would make of the work, would treat separately: *The materials, the tools, the machines, the workmen, the organs.* He would deduce from the knowledge of the resources which the materials offer, from the means offered by the tools, some general principles which must be the guides of the builders for the logical and economic composition of the various parts. The teacher would also make the pupils conversant with the new industrial products; he would study the catalogues with them and discuss the value of the various brands.

The exercises of application.—To the technical lessons on construction would correspond some exercises in detail drawings calculated as if they had to be practically carried out; to the lessons of measurement and verification would correspond exercises of book-keeping, making out estimates, memoranda, drawings to accompany memoranda, &c.

The practical work would consist in the handling of the various tools, some manual work, testing of materials, the making-out of reports of all kinds, and even surveys.

To this school a library and a museum would be annexed.

Relations between the Technical Schools and the Schools of Architecture.—Should technical teaching be given at the schools of architecture and at the Fine Art school, or should it be given in a school absolutely independent of these?

It is impossible to answer this question in a general manner. The organisation of a technical school for the crafts of the building trade, *complementary* to the schools of architecture, will of necessity work in unison with them.

To each special case will correspond a special and adequate solution.

The same answer must be made to the question: Is the technical training to precede, to accompany, or to follow the teaching of the art of architecture?

II.—The Programme from the French Point of View.

Short Summary of the Official Teaching of Architecture in France.—1. L'Ecole des Beaux-Arts. 2. The regional Schools of Architecture. 3. The regional Schools of Fine Arts.

The characteristic Features of their Teaching, the Aims they Pursue, what they Neglect, and Why they Neglect it.

L'Ecole des Beaux-Arts is not a school of architecture, but a *special school of the Fine Arts* in which the art of architecture occupies a place similar to those held by the arts of painting, of sculpture and of engraving. The aim of the Ecole des Beaux-Arts is *to train the mind of the architect*, to put him towards art, and *not* to *teach him a trade*, or to prepare him for *the exercise of his profession.* It chooses its pupils by competition, and only admits men of superior intelligence and aptitude. The results which it has obtained force it to do this; it dominates all that is produced in architecture in France; it even makes its influence felt in other countries in the South of Europe, and especially in America. The technical instruction of the architect, the preparation of the practical architect for the part he is to act in society does not come within his province.

The examinations and competitions in mathematics and in construction which it imposes on its students from the very beginning of their studies of art have no other motive than to eliminate at once those who would be absolutely unfit for the study of the sciences of the building art, and consequently to become true masters of work. But the technical knowledge the pupils must go elsewhere to acquire, and they must, above all, obtain it from experience in the building yards.

It is now beyond any doubt that this instruction left to the chance of experience should be given in a methodical manner, and give rise to a regular course of teaching; in this way our architects would undoubtedly be sooner and better prepared to defend the interests of which they are in charge.

This idea has been the cause of private undertakings which we have just mentioned; but in France the State has not yet done anything in this direction.

What can be done in France.—On the occasion of previous Congresses Mr. J. J. Pillet has already pointed out the programme for such a school; for him the technical teaching would have to form the *secondary teaching* of architecture, the Ecole des Beaux-Arts having to give the *superior teaching* only accessible to a very select few.

At the time when this project was submitted it might have been easily put into practice by means of creating regional schools of architecture, absolutely independent, and the property of the provinces. This would have been a good piece of decentralisation.

In our days the circumstances are altered. By the initiative of M. J. Guadet, the French Government has just established in the provinces some regional schools which are branches of the Ecole des Beaux-Arts. The same courses of lessons, the same examinations, the same exercises, are made there at the same time as in Paris, where the work of the students is sent and judged by the ordinary jury of the Ecole des Beaux-Arts. These schools give the same diploma as the school in Paris.

In the presence of this expansion of the Ecole des Beaux-Arts there only appears to remain one solution to the problem of the technical teaching, viz., the creation, side by side with these schools, of *some schools of application for practical building*, the teaching in which would be absolutely specialised, and which, in connexion with the Ecole des Beaux-Arts, would be in an absolutely analagous position to that occupied by the schools of application for artillery, the military engineers, the mines, the bridges and roads, etc., in connection with the Ecole Polytechnic.

Like these latter they would admit four categories of students:

1. The students of architecture, former pupils of the superior class of the Ecole des Beaux-Arts.
2. The day students admitted by way of competition.
3. The students from foreign countries.
4. The free students attending the classes.

The programme for their courses of lessons would be the one we have indicated just now. Each of them would be taught, under the supervision of an experienced architect with diploma, by assistant teachers from among contractors, artisans and accountants.

The duration of the studies should not exceed two years. The lessons would be arranged in such a manner that the students could attend them while they are preparing for their final competition and for their diploma. The lessons could be given exclusively during the forenoon. The practical exercises would keep the students busy during three months of the year; for instance, from May to July.

At the conclusion of the papers M. Lesage proposed the following resolution:—

This Congress, considering that the architect, the master of the works, having under his immediate direction workmen and artisans of the most varied bodies of the State, and utilising the services of the most varied industries, has no means of acquiring in each of these trades and in each of these industries the complete knowledge of a specialist; considering that there exist already in the majority of European countries training schools for artisans, schools for practical application and laboratories for engineers where specialists are trained, expresses the desire that there should be created *specially for the architects* and for the *general contractors* schools in which, in the limited space of two years, they could acquire in a general but exact manner the technical part of the various trades and industries of the building trade, without claiming to practise these trades and industries. It also expresses the wish that between these schools international and continuous relations may be established.

Dr. Joseph Cuypers, Amsterdam, said he

appreciated very much the papers that had been read, and he thanked the various readers for the time and consideration they had given to the subject. Generally speaking, he was in accord with what the speakers had said, but he would like to have the meaning of the resolution defined a little more clearly. In his view it was very essential that at the very outset of his career the architect should be taught to practise some of the crafts, such as joinery, brickwork, etc., while his theoretical training would continue all his life.

Mr. Maurice B. Adams said it appeared to him that it would be a pity if they could not raise a discussion on the subject which had been introduced by the readers of the papers, and therefore he would venture to say a few words. He had not had the pleasure of hearing the papers in full, particularly that of Professor Lethaby, but he had read the extract that appeared in the printed report, and he need scarcely say that he was entirely in sympathy with the views which he expressed. But much as he admired what Professor Lethaby advocated, the difficulty with architectural students was the vast field which their labours had to cover—the art or arts which he had to supervise had been multiplied in a most enormous degree during his (the speaker's) own time, and although he realised the necessity of architects handling materials, as materials were handled by the practical artificer, he did not see where the time was to come in for the architect to devote to such a purpose. He (Mr. Adams) had himself worked at the joiner's bench for some two or three years before he was articled, and he had never regretted it, but he was not quite sure that that was the sort of thing they should advocate nowadays with the material advantages which had accrued from the various schools which had come into existence. He was enabled, no doubt, to acquire a good deal of knowledge which he would not otherwise have acquired, but he could not help thinking that he wasted a considerable amount of time in acquiring that elementary knowledge, which he did not wish to decry for one moment. It seemed to him that in dealing with a question of this kind they had to realise the exacting conditions under which the architect had to work, and not only the architect had to work, but the builders, and also the system of building which was adopted. Professor Lethaby's advocacy seemed to refer to a more elementary stage of existence than that which we enjoyed to-day. If they had one or two small or even large country houses to build, they could devote a great deal of time to them, but the remuneration was somewhat limited when it was restricted to a small amount of works of that kind. The architect had to compete, as they realised yesterday in the discussion which took place at Conduit-street—the architect had to compete very largely nowadays. Very few men came into the world favoured by circumstances which enabled them to depend on private clients, and therefore the architect had to fight his way by competition, very often against adverse circumstances for a long time, and then when he had succeeded in his work he had to fall into line with the ordinary methods of competition amongst the builders and contractors, and it would be an extremely difficult thing for any individual architect to interfere with the progress of an undertaking commenced and carried on on those lines. Further than that, there seemed to be a growing disposition to go in for direct labour by large municipal authorities, and others insisted upon employing their own men, and thereby emphasising to an enormous degree the amount of labour each architect had to carry on as supervisor or architect-in-chief of the proceedings. It seemed to him they must recognise the conditions under which architects had to work, and, looking at the schools as they were at present existing, it seemed to him that the school of the Architectural Association went about as far as they could reasonably and practically go in the matter of enabling the student to acquire a more practical and technical knowledge of building operations, and that was carried on by enabling him to go on to the buildings in progress and to make reports to his master of what he saw there. One of the first necessities of an architect was observation—that he should observe and note all the things on a building; that he should state his difficulties to his master, and have them explained to him. Of course, if they assumed, as Professor Lethaby appeared to assume, that the modern architect's position was radically wrong from beginning to end—that there should be no such thing as the professional architect at all—then one was able to follow his argument more closely, but he (the speaker) took it that we were obliged to take the world pretty much as we found it, and, of course, even then the architect's work could only be appreciated by the amount of mind which he was able to put into it. No work of art could possibly be a work of art unless it had the full impression of the person who conceived it. If they could leave it to the various arts and crafts to conceive the various parts of the building—the brick and roof work, the masonry, etc.—much on the lines that the old mediæval work was done, that would be extremely good; but he could not see how it could be done, and he did not see what object there was in utilising the student's time for so long a period as would be necessary to teach him those things. He noticed that Professor Lethaby in one part of his paper spoke of a very short time being devoted to craftsmanship as being better than no time at all. His (the speaker's) own experience was that the main advantage in going to work at the bench was that it enabled him to realise how builders handled materials—how they cut up the materials and utilised them; but, as for becoming an expert joiner or an expert metal-worker himself, that was impossible. It seemed to him that they might take up some of those things as a hobby, and have a smithy or a small furnace and go in for enamels and carry on metal-working to a higher form. They did not want to make all architects exactly in the same mould, and, in his opinion, they must deal with that question in a general sort of way. He understood from the resolution that it was proposed that there should be some sort of school arranged with contractors or builders. In that connexion they must remember that builders were ceasing to be builders; they were gradually becoming mere financiers. A builder in the old acceptation of the word was a man that studied, as they wished architects to study, every branch of the building business, but nowadays it was a very rare thing to find a builder that had served his time at the bench as they used to do and had acquired a knowledge of the minutiæ of the various trades. Under the present contract system—whether it was good or bad, there it was, and it had been brought about by modern circumstances—all the builders did was to appoint a manager of each department, and to look to the manager of each department to show a profit on that department's working. So they had not the co-operation of the builder in the sense that they used to have it, and he thought he was correct in saying that there were very few builders—unless they remained in the country in quite a small way of business—there were very few builders who could afford to devote the time, or did devote the time, in the course of their apprenticeship to the business of acquiring that knowledge which was advocated as so necessary for all of them. Therefore, it seemed to him, that what they should do would be to multiply schools like those of the Architectural Association—that the various schools should take that as a basis of their operations, and they should bring the students more into contact with the actual work, and if a man was articled to an architect that he should afford the pupil every possible facility of visiting buildings in progress, and possibly in some cases becoming clerk of the works—although he was not quite sure that it was a fair thing to the owners of the buildings that a pupil should be employed as clerk of the works. He thought it was perfectly clear that they should do something not only to exclude students who had no natural ability for architecture more rigidly than they had done from those schools, but, having got the right material in the schools, one of the best things they could do was to take them as much as possible to the buildings in the way he had advocated.

Professor V. Nagy (Budapest) said it seemed to him that it was very difficult to talk about a question of this kind from an international point of view, as the conditions of things varied in different countries. In his opinion an architect ought to be a man of wide technical knowledge, one who was able to construct everything that his fancy conceived, and he must be an artist to give a pleasing form to that which he was able to construct. The knowledge and requirements of the architect covered such a vast field that they, as professors, knew that it was only possible in a short time or a few years to give an architect the foundation of the theoretical as well as the technical education in his profession. He thought that the resolution which had been proposed by their French friends went too far in many respects. It was like sending a wanderer from home and charging him with so many things that he would be obliged to drop, as it were, necessary things in order that he might be able to go on his way. What he meant was—let them confine themselves to teaching the necessary things, and other things the student could pick up on his way as he went along through life. What he personally felt was that the architect's work was endangered by something else than a lack of exact knowledge of the different crafts. It was the engineer's work which endangered the architect's work. The progress of technical studies, especially in iron buildings had, he considered, not only in his own country but all over the world, taken architecture out of the hands of the architects, and the result would be that the architect would no more be the conceiver or the constructor of his ideas, because he could not follow them out. Therefore, if there was time to be spared on the education of architects, he would rather that it should be spent in acquiring a knowledge of those things which could not be picked up on the road when he was in practice. On the other hand, as regarded the crafts, it was easier to pick them up by practice rather than at a school. His idea was that two years was far too long to devote to acquiring a technical knowledge of the different crafts. The architectural student was already overcharged, and a short time, just to get a fundamental knowledge of the different crafts, would be sufficient. He would therefore propose that the resolution read as follows:—"This Congress, considering that the architect, the master of the works, having under his immediate direction workmen and artisans of the most varied bodies of the State, and utilising the services of the most varied industries, has no means of acquiring in each of these trades and in each of these industries the complete knowledge of a specialist, expresses the desire that opportunity should be given to architectural students to acquire in a general but exact manner the technical parts of the various trades and industries of the building trade without claiming to practice their trades and industries. It also expresses the wish that between these schools international and continuous relations may be established."

Professor Lethaby asked Professor Nagy if he would consider two years too long if it was understood that the student was to be instructed in his profession from the highly scientific and engineering point of view. That was his (the speaker's) idea of the meaning of the resolution as it stood. The school he had in his mind should not merely concern itself with handicrafts but should be a technical polytechnic.

Professor Nagy said that if the idea was to include theoretical and technical studies then he was quite satisfied.

Professor Lethaby said that was his meaning.

Mr. Blomfield remarked that such a school as outlined by Professor Lethaby would meet a want which was much felt in England, and that was the want of training in expert building. Professor Nagy had pointed out that the engineer was rather taking charge of the work of the architect. The right way to meet that was to train the architect to obtain some knowledge of those problems of engineering which at present were handed over too much to the engineer. The resolution seemed to him to deal with that difficulty, because both M. Le Sage and Professor Lethaby had made it plain that their idea was that the two years' training should be devoted to those higher problems of building to which he had referred. He should therefore support the resolution.

Professor Nagy said that what he understood by craftsmanship was the handling of tools, and therefore he thought that two years was too long to devote to such an object. He would rather that the resolution were carried as he had proposed to amend it, because under it each country could teach

what trades they liked. England could take up the science of engineering if so desired, but in France perhaps that would not be necessary, because, there, architects were trained in engineering work, and in Austria and Hungary it would simply mean that the students would get a certain training in the material part of their crafts.

M. Lesage was understood to be willing to accept the amendment.

Dr. Cuypers remarked that, in his opinion, instruction in practical work should be at the beginning of every architect's education, and their theoretical education would come afterwards.

Mr. C. Walker (Boston, U.S.A.) said that their custom in America was somewhat different to that of other countries. He was a director of the Mass. Institute of Technology, and a director of the Department of Design of the Museum of Fine Arts, and it was his experience from having pupils in his office, and in each of those Departments, that where there was marked specialisation on any one thing, that the pupil became so enamoured of that particular thing that it hampered him in his after work. The general education—both theoretical and practical—should run side by side, and it should always be recognised that the architect was primarily a man of affairs, and one who planned—he was essentially a man who planned if he was to be an architect of ability and of large work and who controlled a large number of men. Every attention paid to small details crippled him, to a certain extent, in the carrying-out of his large work, and while it was absolutely essential that he, as the chief builder, should understand the general manipulation and character of his material, any special attention paid to that for any length of time was certainly, in his (the speaker's) opinion, and in the opinion of the schools that he represented, work which it was not wise to undertake. They should be carried on correlatively, and special attention should always be paid to the larger project, and that was the handling of men and the beautifying of the plan. In his office he had had men educated in different ways, and the ones who were educated in technical perfection were inefficient in the larger problems. The ones who were educated in technical perfection of any kind, whether it was in engineering or any crafts, did not in their later life become men of affairs—they did not become the leaders of the profession in America. Therefore, in his opinion, it was inadvisable to name any definite period for the instruction of architectural students in technical matters.

Mr. H. G. P. Maule said that his knowledge was derived from practical experience of seeing how much students were capable of taking in. He agreed with every word that Mr. Blomfield said in his paper. It seemed to him that there had been one point that had been entirely forgotten in the discussion, and that was that an architect was always a student—he remained a student as long as he lived, and if they remembered that, and if they took into consideration the very few years in which he could be definitely trained, it seemed to him that they must confine themselves during those years to a great extent to the principle, and not go into a great mass of detail. They must, he thought, endeavour, during that short period of training, to instil into the student principles which would guide him all his life, and by which he could go on improving his education. It seemed to him that if they bore in mind the principles which Mr. Blomfield had enunciated, and if they also bore in mind the great advantage of knowing something of the crafts, it only rested with the student or the young architect to go on adding to and completing his knowledge for many many years. If they attempted to overburden the student in his early years, they would simply confuse him. There was no greater danger in education than confusion, and if they confused a student they ruined him. Therefore, keeping in mind the international point of view, he would ask them always to keep in mind that they had to train in principle rather than in detail, and if they endeavoured to do that he thought they would raise the whole status of architecture throughout the world—they must teach the student to educate himself by hi sown initiative and his own observation.

Dr. Cuypers (Amsterdam) observed that they wanted to get back to the practical principles of every-day life in regard to the education of the architect.

Professor Lethaby said that, as there seemed to be considerable difference of opinion as regarded details, it occurred to him that the needs of the case would be met if they were to pass a resolution merely agreeing to the principle that architectural education should be founded on the basis of practical construction in the building trades. If some such general proposition could be agreed upon, without entering into details, he thought that would be sufficient.

Mr. Blomfield said it seemed to him that the proposition of Professor Lethaby that training in architecture should be founded on a training and knowledge of the building crafts was unassailable, and he would be very pleased to support that proposition provided it was understood that that was not supposed to be the whole of the training of an architect. He thought they would all agree that no man could claim to be a competent architect who had not got more than an amateur knowledge of the building trade. He was rather inclined to question the view of their American colleague respecting the architect. They did not consider that the man who would be called a leader in the profession was the ideal to which they should direct the attention of architectural students. They heard very constantly that the architect was an artist—he might be successful or not—they could not control the future. What they wanted was to turn out the best architects, and by the best architect they understood an artist in bricks and mortar, and stone, and wood in building forms. Before they could arrive at that they must understand those forms, and that knowledge could only be gained by the handling of the tools and the materials. He agreed with what Mr. Maule said, that, after all, what they gave to the student was only the ground work of his training. They endeavoured to give students the real rudiments of the technique of the work, and the student himself must add to that the transformation of his work into beautiful forms and get into it some of the quality that they all admired in great architecture. That was the point of view he had endeavoured to put before them in his paper, and he thought that his paper and that of Professor Lethaby should be taken together. He very rightly insisted on training in what he might call a building sense, and he (Mr. Blomfield) wanted it to go still further, and to continue it in the sense of architecture.

Mr. Maurice B. Adams said he was really quite in a fog as to the way in which Professor Nagy had amended the resolution, and he would be glad if the Chairman would read it in its amended form. Mr. Blomfield had said that it did not go far enough. If that was so, why should they not make it go far enough—they had met for that express purpose. They were apparently all of the same mind, and it seemed to him that it would be far better for them to pass something practical. As he understood the resolution in its present form it was simply a pious opinion.

The Chairman then put the resolution as amended by Professor Nagy, and it was carried unanimously.

Mr. Adams, in proposing a vote of thanks to the Chairman, said that the vast experience of Herr Wagner in all that belonged to their art was well known to all of them. It was a great satisfaction to them to meet their *confrères* from all parts of the world, and to realise that they were all working towards the same common realisation of beautiful buildings under, very often, the most adverse circumstances.

Dr. Cuypers seconded the resolution, which was carried with enthusiasm, and the Chairman having replied, the proceedings terminated.

The Planning and Laying Out of Streets and Open Spaces

In the evening a good audience assembled at the Grafton Galleries to hear the various papers which had been prepared on this subject. The chairmen were Sir W. Emerson and M. Ch. Buls, of Belgium. The Secretary was Mr. Perkins Pick, England.

After a few opening remarks from Sir W. Emerson, the papers were read, that of Dr. J. Stübben, of Berlin, being illustrated by a number of excellent lantern pictures.

M. Ch. Buls, Hon. President of the Société Centrale d'Architecture de Belgique, read a paper on behalf of the Société Centrale d'Architecture de Belgique, of which the following is an abstract:

Streets.—If it is desired to lay down the rules to be followed for the creation of streets and squares, the following three hypotheses must be considered:

First, an entirely new town to be founded. This is a rare occurrence in Europe; an instance of it is Zeebrugge, in Belgium.

Secondly, a quarter of an old town to be transformed into a modern quarter. In this case it is necessary to leave untouched the picturesque aspect of the quarter, to preserve the historical monuments, while endeavouring at the same time to satisfy modern requirements.

Thirdly, a new suburb to add to an old town. Establish the plan of the principal directions of circulation, adapt it to the topography of the place, determine the character of the quarter according to its destination: *i.e.*, whether to be of a commercial, industrial, administrative, popular, universitary, middle-class or aristocratic character.

Servitudes to be established to preserve to it the character it is intended to have. Expropriation by zones or participation of the owners of the land in the management expenses.

Forms of the Streets.—Straight or almost straight principal arteries; sinuous secondary streets. The straight streets must not be too long; after every thousand metres they must be deviated or end in a monument.

The squares arranged in these streets must not be circular, but oval. They can besides be varied by not giving a uniform width to the whole street.

Intersection of the Streets.—Avoid converging the circulation to a single point: it must, on the contrary, be distributed over the whole town.

Cross-shaped intersections should be avoided.

Open Spaces.—In ancient times the public squares were the forum as the political centre, and the market-place as the commercial centre. In the North, in the Middle Ages, there was the open space in front of the church and the large market-place in front of the town-hall.

1. *The Squares for Circulation.*—The star-shaped squares are to be condemned: they lead to congestion in the circulation and form a too cut-up picture.

The streets must end in the corners of the squares.

2. *Markets.*—The centre of the market-place must be free, the streets leading to it must not be numerous, and must end in the shape of turbine paddles.

3. *Garages.*—Squares outside the railway stations; there the circulation must be divided by open spaces, fountains, and statues. Towards the town there should be a monumental entrance. Within the town spaces must be reserved for cab-stands.

4. *Ornamental Squares.* — Squares planted with trees. They can be made of any shape.

5. *Monumental Squares.*—Squares created to produce an artistic effect.

(*a*) Proportions of the squares—The height of the houses should be in harmonic proportion with the dimensions of the squares. Rules established by M. H. Martens.

(*b*) Shape of the squares.—Rectangular ones in the proportion of 1-3, trapezoidal and triangular ones. Circular and octagonal shapes to be condemned. Oval shape admissible.

(*c*) Framing of the squares to be recommended; dissimulate their openings by grates, arcades, &c. Streets opening into them in turbine-paddle shapes.

(*d*) Grouping of the squares produces a picturesque effect. These squares may surround an edifice.

(*e*) Decoration of squares. Sometimes symmetrical, but as a rule the absence of symmetry is preferable. It is better not to place the statues and fountains in the centre of the square.

(*f*) Levelling of the squares. The concave surface is to be preferred for æsthetic and practical reasons.

Conclusions.—The principles which we have

just exposed are the result of the research of practical means which can make a modern town comfortable and hygienic, and impart to it a beauty which renders a sojourn in it pleasant.

A town must not only be a commercial store and an industrial factory, but also a home for human beings.

Since the towns are no longer formed by the slow increase of centuries, they have lost their picturesque charm and their national character.

To the unconscious work of the builder of ancient times must be substituted the conscious work of the modern builder. The mission of our town architects must therefore be to adorn the towns with a new beauty, the elements of which will be furnished by the wants of a heavy traffic, of a healthy life, by æsthetic principles, derived from the study of the laws of artistic enjoyment.

Town builders, trustees, and architects must be inspired by the fine verse of Terence:

> Homo sum, et humani nihil a me alienum puto!
> (I am a man, and no human feeling is indifferent to me

The following is a summary of the report by M. Eugène Hénard, architecte diplômé par le Gouvernement, Paris:—

Definition of the various kinds of locomotion in the large towns. Household circulation, professional circulation, cheap circulation, general circulation, holiday circulation, and exceptional popular circulation. Corresponding ways of circulation and width of the streets. Necessity of increasing their width on behalf of motorism. General distribution of the net of public thoroughfares. Geometrical distribution of the new towns. Rectangular system, radiary system, mixed system. Insufficiency of these systems. Search for a principle for laying down the net. Comparative study and plans reduced to the same scale of the four large capitals, Berlin, London, Moscow, and Paris.

(Plate I.) Description of the plan of Berlin. Theoretical idea of this plan (Plate II.). Description and theoretical idea of the plan of London. Description and theoretical idea of the plan of Moscow. New notion about the perimeter of radiation drawn from the comparison of these plans. Description and theoretical scheme of the plan of Paris. Insufficiency of the radiating streets of Paris. Idea of what a modern town must be. Advantages which men must find in the large towns. General distribution of a large town. Centre of activity, centre of business. Periphery of dwelling-houses. Consequences from the point of view of the ways of circulation. Circulatory net analogous to that of a living organism. Necessity of directing the streets towards a closed uniting centre or perimeter of radiation, making the central nucleus less congested. Abnormal situation of the present public streets in the large European towns in consequence of their business development. Necessity for widening the too narrow streets of the central nucleus. Presence of the most ancient historical monuments in this centre. The duty of leaving them untouched. Inconvenience of tracing in a straight line the new streets, if it is too strictly adhered to. Usefulness and beauty of spacious or widening streets.

The open spaces, parks or gardens. Respiratory organs of the large towns. Objections of the speculators. Usefulness of parks for the education of children. Æsthetic influence of the parks and gardens. Comparative studies of the parks and gardens of the four large cities, London, Berlin, Moscow and Paris. Total surface of the agglomeration built over, population and surface of the interior and exterior parks in those four large cities. Usefulness of the outside parks. Necessity of the interior parks. Comparative plans of the interior parks (Plate III.) Difficulty of the comparison. Selection of a common surface of comparison. Surfaces of the parks and open spaces of each of those large towns compared with their area. Superiority of London. Diminution of the open spaces in Paris. Reason for this diminution. Measures to be taken by the municipalities to remedy it. Proportion to be observed between the open spaces and the areas covered with buildings. Good and bad distribution of the parks and gardens. Idea of the garden cities. Advantages and drawbacks of this system. Means of rendering the clusters of houses less compact. New type of boulevards, called *à redans*. Formula of the boulevard and its description. Plan and perspective of a *boulevard à redans* (plates IV. and V.). Its advantages from the hygienic point of view of the houses. Comparative plan of a fragment of a *boulevard à redans*, and of part of an ordinary boulevard from the point of view of the utilisation of the land (plate VI.).

Application of the foregoing theories to the study of the transformation of Paris. Present defects of the plan of Paris. Project of the proposed distribution (plate VII.) and central nucleus. The new system of the eighteen radiating streets. New streets and old streets utilised. Creation of new parks. Distribution of these parks. The twelve peripheric parks put into communication with each other by the grand circle of the *boulevard à redan*. Estimate of cost. Delay necessary for its execution.

Conclusion.—Usefulness of the putting together and comparing the graphic documents of the large towns. Proposal by Sir Edwin Cornwall to assemble a Congress of the capitals. The part which the architects could play in this Congress. Proposition to constitute by a uniform method, and with plans reduced to the same scale, the technical documents of all the large cities.

A paper by MM. B. Polles y Vivó, J. Majó y Ribós, and Bertrand de Quintana was also read. It was stated that in laying out open spaces account should be taken of various circumstances, those especially which are attendant on the climate of the locality, though varying according to latitude, altitude, direction of dominant winds, and the greater or less distance from the sea and great rivers, the position of neighbouring mountains, frequency of rains, nature of soil, etc.

Of all these circumstances, those which have a preponderating influence are the direction of the dominant winds and the latitude.

What evidently demonstrates the importance of the direction of the dominant winds is the position of edifices included in the category of insanitary buildings, which, on account of the many emanations affecting the atmosphere, should not be so situated that the currents of air may carry these insanitary emanations into the open spaces of a city, thus converting into a focus of infection the air which our dwellings receive from outside.

In consequence of this, one ought to study conscientiously the situation of a cemetary, a crematorium, an establishment for the filtration of infected water coming from a system of sewers, a hospital, a lazaretto, certain industries, &c.

With regard to the latitude, or distance from the equator, and setting aside the differences of temperature, consequent on the greater or less distance from the poles, and following the geographical points which are under consideration, one of the most important factors in the solution of the problem, and one on which we ought to fix our attention, is the consideration of the angle formed by the solar rays with the plane of the horizon of each locality, an angle which diminishes as the latitude increases.

According to the reports of the International Congresses of Tuberculosis, and of Salubrity and Hygiene, held recently at Paris, it cannot be doubted that one of the essential points to be secured is to place the dwelling in hygienic conditions, and that its façades should be so exposed as to receive the rays of the sun and pure air for as long a time as possible. To obtain this result it is obvious that we ought to orientate the streets, determine their width, and fix the height of houses, so that the access of the sun's rays should be assured.

As our limited scope does not permit us to trace geographically the course of the solar rays for each of the latitudes corresponding to each degree (a method which would give a precise idea of the matter), it will be enough for us to consider the distinctive latitudes corresponding to the equator, latitude 0 deg.; the tropics, 23 deg. 27 min.; an intermediary point, for instance, Madrid, 40 deg.; the polar circles 66 deg. 33 min.; the poles 90 deg.; to demonstrate clearly that the maximum angles which the solar ray corresponding to twelve o'clock, that is to say, the hour at which the sun passes over the meridian of the locality, forms with the plane of the horizon at the time of the summer solstice, the equinoxes, and the winter solstice, are the following for the said latitudes:

	Latitude	Summer Solstice	Equinoxes	Winter Solstice
	deg. min.	deg. min.	deg. min.	deg. min.
Equator	0 0	113 27	90 0	66 33
Tropics	23 27	90 0	63 33	41 33
Madrid	40 0	73 27	50 0	26 33
Polar Circles	61 33	46 54	23 27	0 0
Poles	90 0	23 27	0 0	23 27

From the preceding it is evident that the various open spaces for each city, streets, squares, promenades, etc., and those by analogy reserved as courtyards to facilitate the access of air and light to houses, ought to increase in breadth as the latitude of the locality increases, whilst the heights of the houses ought to lessen as the latitude increases; in other terms, to avoid one façade casting a shadow upon another, the breadth of the streets must increase proportionately with the latitude of the locality, and the heights of the houses must lessen in the same proportion.

To give to the subject we have just sketched all the development that it deserves would take a volume filled with scientific and learned explanations, and as these notes are intended for an audience composed of experts we would like to avoid falling into this error, and we will conclude our remarks on the portion of the hygienic problem intimately allied with the title of the theme we are discussing, with the following conclusions:

1. That the means of communication in cities should be laid out so that in no case should they serve as a canal to conduct the impurities coming from unhealthy industries, which necessarily exist in all centres of population; that is to say, that strict care must be taken that the situation of these buildings be fixed in such a way that the dominating winds can never carry into inhabited localities the unhealthy emanations from them.

2. That the dimensions of open spaces in a city should be subordinate to the density of the population as well as to the latitude; in other words, the more populous a city the greater should be the area of its open spaces; a condition which can be obtained through the means of communication and the courtyards belonging to houses. Considering besides that the sun is essentially the purifying element, in order to obtain its presence for the longest time possible in the fronts of buildings it is necessary to increase the area of open spaces and to diminish the height of constructions as the latitude of a city increases.

Dr. J. Stübben, Berlin, read a paper on the subject, which was arranged under three headings:

I.—Planning of Streets.

Traffic.—The direction and width of streets depend on the claims of the traffic to be accommodated. Traffic must everywhere and in every direction find a clear view and an unimpeded path. In main thoroughfares the width desirable may be 50 metres or more; in bye-streets, where the traffic is solely for the service of the residents, the width may be reduced to 8 metres. All intermediate widths depend on the circumstances of each case.

The gradients of streets should be as flat as possible. In level districts gradients of more than 1 in 70 should be avoided as far as may be, because they interfere with the asphalting of the road surface. In hilly districts gradients up to 1 in 20 are permissible in the case of main thoroughfares, and up to 1 in 10 in the case of side-streets. Where steeper inclines have to be dealt with stairs or footways should be provided The latter should be employed more frequently than is at present the case on mountain slopes and for diagonal crossings of long blocks.

Health.—For hygienic reasons, streets running due east and west should, where possible, be avoided, because the houses on the south side during the greater part of the year do not receive direct sunshine. The width of a street should be at least equal to the height of the houses in it. Broad streets should be

planted with rows of trees and garden plots. Forecourts in front of the houses favour the access of light and air, and often allow a reduction of the width of the roadway. Very wide and bare streets are to be avoided, owing to dust clouds and lack of shade. The same remark applies to long straight streets, especially when they lie parallel to the direction of prevailing winds.

Beauty.—On purely æsthetic grounds there is as much to be said for straight streets as for crooked ones, and for a regular as for an irregular building line. In hilly districts curved streets facilitate traffic and the laying out of sites. In level districts the adoption of straight or crooked, regular or irregular lines depends both on practical considerations and also on the artistic intentions of the designer. Straight streets of great length should be avoided; the remedy is to curve or change the direction, also transposition of the direction or building lines. Transpositions are, however, only permissible in so far as they do not interfere with a clear view of the traffic. Convex changes of gradient are to be avoided in straight streets as far as possible. Concave levelling is to be preferred. Unavoidable stopping-points ought to be treated artistically as terminal points. Every street ought as far as practicable to be planned individually. A change of width in different parts of the same street may serve to add to its beauty. Self-contained street pictures are everywhere to be aimed at.

II.—Planning of Open Spaces.

Traffic.—Open spaces are required for dealing with streams of traffic at points where streets converge, at railway stations, bridges, city gates, &c. For practical reasons, it is desirable that the various lines of traffic should not intersect one another at one point. Spaces devoted to traffic lack, as a rule, one quality of artistic importance—viz., the setting of a proper frame. They can, nevertheless, be made to present a pleasing appearance. The lack of a suitable frame may be to some extent compensated by so arranging the lines of the streets that the eye travels over the open space and rests on a boundary wall. Useless traffic areas resulting from the unnecessary meeting of streets are to be avoided.

Market-places should be near to some main thoroughfare, but their main area should not be open to vehicular traffic.

A considerable number of open spaces are desirable in the interests of fresh air. They should occupy at least one-tenth of the total area of a town. Spaces planted with trees and flowers, such as *gardens* and *recreation grounds*, are important to health, as are also public parks and promenades.

Beauty.—The chief artistic quality of open spaces lies in their being as far as possible enclosed in a proper setting. This applies to market-places and garden, but especially to spaces of a purely architectural character, *i.e.* spaces intended as sites for monumental buildings. The preferable position for these buildings is at the side of the open space rather than in the centre. In this latter position the necessity of a framing for the remaining portions of the space holds good. Porticoes and porches, which can be carried out into the street openings, help to close in the frame. Errors in scale, especially unduly large open areas, are to be avoided. Convexity of the open space is inadmissible. Concavity is preferable. Each open space should, as far as practicable, be laid out individually.

Combinations of spaces are subject to various requirements, according to the purpose for which each is intended, *e.g.*, whether it be for purposes of traffic or as a site for monumental buildings. The *grouping* of several separate spaces can be made to produce fine effects from an artistic point of view.

III.—Planning of Cities.

Historical Development.—It is instructive to pass in review—The formal cities of ancient Greece; the formal and informal cities of the Romans; the irregular cities of the earlier Middle Ages; the regularly laid-out towns of the later Middle Ages, of the Renaissance, and of the Baroque period; the systematically designed cities of America; the improvements in towns carried out during the nineteenth century, for the most part geometrical in character; and, finally, modern ideals.

Traffic, Hygiene, Beauty.—Modern ideals are in the main based on the principles given above for the design of streets and spaces. We cannot simply imitate the cities of an earlier age, since the requirements of the traffic and of hygiene have altered. That the ground plan of a city should be clean and orderly is of importance. The task of the artist lies in a perfect adaptation to use, combined with beauty of form. In other words, the arrangement of the open-air space shall satisfy æsthetic demands, while at the same time it must provide, as completely as possible, for convenience of locomotion and health.

Economic and Social Requirements—In addition to the claims of traffic, health, and beauty, economic and social considerations require attention. The streets and blocks of buildings must, in their character and dimensions, conform to the economic and architectural necessities of the inhabitants. Broad main thoroughfares must be provided for the bulk of the traffic, narrow side-streets of private houses serve to divide the area to be built on into separate blocks. The various parts of the city ought, even in the first rough plan, to be divided up in accordance with the purpose they are intended to serve, viz., into rows of houses or detached and semi-detached buildings; into tenements or private houses; dwellings for the upper, middle, or working classes; shops and retail or wholesale manufactories, etc. Attention should be paid to their relative position in regard to the centre of the town, the surrounding country, the railways, and the harbour. As in the case of isolated thoroughfares and open spaces, so too in the case of whole quarters of the city individual character should be aimed at.

Care of Monuments.—Ancient monuments of all kinds, as well as fine existing streets and views, ought not only to be preserved, but should be taken advantage of in order to secure a characteristic development of the city on artistic lines. (Forty lantern slides were shown to illustrate this paper.)

A paper was read by M. Gaston Trélat (Paris), the author's summary and conclusion being as follows:—

Streets are never wide enough to allow the traffic in the roadway to develop without leading to obstructions. These latter occasion loss of time inconsistent with the rapidity which the means of locomotion tend to insure; again, they lead to a confusion in the streets which is not in harmony with objective beauty. The leading fact of the day is a more and more accentuated rapidity of movement from place to place, thanks to which the former suburbs of capitals or towns are joined, or can immediately be joined, to the centres of the agglomerations. Hence the possibility of assimilating the new localities to the old districts where the urban employments are centralised. Thither, then, should be transferred the dwellings which up to the present have crowded the centre of the towns, where they tend to spread transmissible and preventable diseases.

The enlarged agglomerations would gain considerably in healthiness and brightness, in contrast with these faulty concentrations of dwellings, cramped and one above the other in comparatively restricted spaces.

Uninhabited areas could take the form of parks, squares, gardens, avenues planted with trees; and even private squares could be made on pieces of ground large enough, so that the buildings would line the public roads. And all this should be planned and settled before it is too late. This necessary preliminary work should be carried out under the ægis of the municipal authorities independently of the exigencies of execution, which should be effected according to financial possibilities and intentions. Nothing should be executed which is not in accordance with general harmony, of which it is expedient at once to have some idea, in order to ensure the realities, such as present knowledge bids us consider them.

This would, therefore, be a technical focussing of the progress that science faces in our days. From this would follow later the prescribed realisations in accordance with the views that our intellectual life may well admit of.

It is necessary to get away from the antiquated methods which up to now have served as the bases of the regulations of the highway authorities. In order to do this it would be expedient to appeal to competent meditations and deliberations, all having as their primordial object the health and well-being of the community. For it is in the exclusive interest of the community that such regulations ought to be made.

Conclusion—Consequently there is reason to express the desire that for all important agglomerations plans should be studied without delay. They would have to take into account the conditions inspired by science and which interest health, such as rapidity of movement from place to place.

These plans would, therefore, require a focussing of the technical solutions to be drawn from science. They would be carried out according to local requirements and budgetary possibilities. But nothing would be done which was not in accordance with an *ideal* in keeping with the knowledge of the age.

The Planning of the Residential Districts of Towns.

The last paper was by Mr. Raymond Unwin. He said:—

While towns in England are growing as rapidly as those of other countries, we have not studied the question of town development, as many of the other countries have. In Germany, for example, there is a large literature and at least one good periodical devoted to the subject. German municipalities have extensive powers, and are in the habit of making plans to regulate the development of their towns. The English haphazard system of allowing towns to grow has only to be compared with this to be condemned. It is necessary for our municipalities to secure additional powers; probably the best way would be to begin by forming committees in each town to watch over and criticise town development from the æsthetic point of view, and these committees should work for the appointment by each municipality of a professional expert whose special duty it should be to examine and criticise all development from the point of view of its effect on the appearance of the town.

It is important for us to study what is being done in other countries, but we must not necessarily accept the conclusions they have arrived at as indicating the best methods for our own development. This is eminently work for architects, who alone have received the necessary practical and artistic training.

It is the regulation of the vast growth of residential districts around our towns which is most required in this country. Valuable suggestions may be obtained quite as much from old English villages and towns as from the ancient Continental towns which the school of Camillo Sitte have taken so much as their model.

Both alike suggest the great importance of defining and limiting suburban areas. Old towns were often defined by their walls with beautiful effect. We need to replace with some more comely girdle the ragged edges and rubbish heaps which surround our modern suburbs; belts of park land, meadow, wood, or orchard, often of quite narrow width, might be used with good effect.

In suburban areas the larger buildings will be few, but should be grouped, so as to produce some enhanced effect and some definite centre for the life, as well as for the plan, of the suburb or district. The judicious use of planting may help to link together buildings in centres where there may not be enough fine buildings to make an adequately large enclosed place. The growing desire for greater space and more openness of outlook is an important and difficult element in our problem.

Before attempting to lay out a new area the site must be very carefully studied, a contour plan must be made, and a survey of trees and many other features of interest. Even well-grown hedgerows may sometimes be helpful; anything that will break the naked newness of a suburban area should be preserved. The plans should be thought out on the ground and committed to paper afterwards. It is impossible to study too thoroughly a site and its conditions; the proper directions for the main roads, the various centres, factory areas, etc., should all be settled on the site. A symmetry which will look nice on the drawings is of no value; but definiteness of

figure in the main framework formed by the chief roads of a town or district is certainly valuable to enable people easily to find their way about. The whole of the plan should be based on definite reasons rather than abstract rules, and one cannot be too willing to consider suggestions from the site. Rules cannot be laid down in favour of straight or curved roads; each form has its beauty and use; the mere aimless meandering road will be quite as monotonous as the straight road. The contour of the ground or existing features having curved lines springing from natural causes may suggest very beautiful curved roads, but straight roads opening up a beautiful view, or affording fine avenue effects, may be equally satisfactory. Each road should be given some distinctive character, which may be enhanced by planting it with a special kind of tree. Greater variety than at present should be allowed in the width of roads, in their construction and decoration, according to the purposes they will serve; bye-laws need revising in this respect. Great care is needed in decorating roads with trees or gardening; everything must be kept very simple and broad in effect. The dignity of many fine streets and parks in Continental towns has been destroyed by the introduction of wriggling lines, of beds of variegated foliage, and such like.

The best direction for roads to take for residential purposes depends so entirely on the designing of the houses that no rule can be laid down. Roads running east and west may give a south aspect for all houses provided only that the superstition that a house must have a tidy front to the road and an untidy back away from it can be exploded, and houses for the south side of the road be designed with their living-rooms facing from the road and their so-called backs made tidy and presentable to face the road (Diagram I.). The advantage of roads running north and south, or thereabouts, is that both sides of the houses get an equal amount of sunshine. An important improvement required in suburban districts is the better grouping and arrangement of the houses. Endless repetition of detached or semi-detached buildings becomes quite as monotonous as the endless rows of houses. Valuable suggestions may be obtained from our old village greens, cathedral closes, and college quadrangles. Even the throwing together of a few front gardens may help matters, but where smaller houses can be built in groups, and the groups be designed as a whole, and where such groups of houses can be arranged on two or three sides of an open garden or green, or even where they can be set back from the road at varying distances, not only may variety and beauty be given to the road, but greater openness of outlook may be provided for the houses, and very often some small distant view may be given.

Variety of effect in the streets is very desirable, but it must never be forgotten that mere variety is not in itself necessarily pleasant, in fact is seldom really satisfactory unless it is variety within some enclosing unity. For the town-planner it is most necessary that he should understand wherein consists what we call natural beauty, and while he should seek every opportunity that the site may afford of pleasant natural beauty and the interest and picturesqueness of happy accident he must never forget that he cannot design happy accident or natural beauty.

M. Buls said he took exception to M. Hénard's paper because he said it was not always convenient to have garden squares in cities. Certainly they prevailed in England, Germany, and Scandinavia, but in the formation of new centres, and the reconstruction of them it was important to note before the architect made his plans to what the quarter was to be devoted. For instance in a commercial centre garden squares would be out of place.

Mr. Albert Kelsey (Philadelphia) said that the tendency throughout America where gardens were in front of houses was that when the locality changed, the gardens were built over with shops.

Sir W. Emerson, in proposing a vote of thanks to the readers of the papers, said he regretted that time would not allow of a discussion. From the papers that had been read, it was evident that the writers had given great pains and attention to their tasks. The way in which large towns and cities should be laid out was a most interesting one at the present moment, and, especially to Londoners, for the Metropolis was increasing every year, and was stretching out in all directions, and this question of the laying out of extensions to large cities was one that met them every day. They were exceedingly indebted to Dr. Stübben for the time he must have taken in getting out the plans he had shown them, and they were also indebted to M. Hénard for a most interesting paper. The remaining papers, which time had not permitted to be read would appear in the printed proceedings of the Congress.

The resolution was carried with acclamation.

Mr. Frank Miles Day, of Philadelphia, President of the American Institute of Architects, obtained the chairman's permission to show a few pictures of American cities to illustrate the ideas which had been advanced in the papers. He explained that, to take Cleveland as an example, the problem of the plan of the city was always bound up with the plan of the city's parks, and in the picture he showed the relation which the park system bore to that portion of the city where the new entrance was now being constructed. The new entrance occupies the central part, and the park system extends to the outskirts. A number of public buildings had to be constructed in Cleveland, and instead of scattering them about the city, it was found better to create a new hall extending to the heart of the city and flank it with the various public buildings. Those public buildings were now being constructed. The hall was partly constructed and the Government building was very well advanced. The whole scheme was a very interesting one, especially in view of the fact that the rearrangement of the buildings in this monumental fashion would only cost about 10 per cent. more than if they had been sprinkled about the city. Many other cities in America had taken their cue from Cleveland and had proposed group plans. In Buffalo they had a radiating system. St. Louis had a need at the present time for the construction of public buildings, and it had been proposed to carve out a certain area for the purpose; placing at one end the public library and at the other end certain municipal buildings. The town hall had already been constructed and it was proposed to place the court house at the other end, the whole having the wall in the centre. The twin cities of St. Paul and Minneapolis had a curious and interesting park system, which it was proposed to extend very largely. The picture he had showed the proposed arrangement in connection with the new State capitol which had just been finished. Mr. Burnan was not long ago commissioned to study the plan of Manila, and he had made certain important proposals, and he proposed to overlay the city with a system of diagonal roads, so that the straight roads of one portion of the city became a diagonal road—an ingenious solution of a city on a diagonal plan. Mr. Day then showed a picture of a recently completed plan for the re-erection of San Francisco, which was now under consideration. In the plan the city was laid out in a rectangular system, differing slightly in different parts, but consisting almost entirely of diagonal avenues. It was, he said, proposed to cut diagonal avenues in various centres and to take the high portion of the city and make a great park extending down to the sea, although there were already vast park areas. Washington was another city having a large park area and it was proposed to erect all the public buildings in a certain way; the building for legislative purposes being placed around the capitol, those for executive work around the White House, and those for municipal purposes along the Mall. In the four years since that scheme had been proposed at least ten important buildings had been placed in accordance with those proposals.

Mr. Max Clarke in proposing a vote of thanks to the chairman said they were especially indebted to those gentlemen for allowing Mr. Day to exhibit his photographs. From the little he had heard of the papers they might have been more or less theoretical and perhaps problematical, but Mr. Day's contribution had clearly brought home to them that such a thing could be done if it was only treated in a large way.

The resolution was carried with acclamation, and having been acknowledged by the Chairman, the meeting terminated.

[Our Report of the Proceedings of the Congress will be concluded next week.]

THE BUILDERS' BENEVOLENT INSTITUTION.

THE fifty-ninth annual general meeting of this Institution was held at 31 and 32, Bedford-street, Strand, W.C., on the 11th inst., Mr. J. W. Chessum presiding.

The minutes of the last annual general meeting were read and confirmed, and the Committee of Management submitted the following annual Report, which was adopted:—

The Committee has the pleasure to submit its fifty-ninth annual Report. Thanks to the kind support of old and new subscribers, the funds of the Institution for the past year did not suffer quite so much as was feared through the continued depression in all branches of the building trade. The appeal of the President (Mr. Benjamin Hannen) in November, 1905, was responded to so generously that Mr. Hannen had the satisfaction of announcing a record list of benefactions at the last annual dinner. The President and Committee take this opportunity to tender their sincere thanks to the donors and subscribers, and would much like to see the names of many more master builders among them. The Committee exercises the greatest care and economy in administering the funds of the Institution, and investigates thoroughly all claims upon them. Elections of pensioners were held in November, 1905, and in May, 1906, at which four men and four women were placed upon the list. Contested elections were again avoided, and the Committee is still of opinion that, in the interests of all concerned, this is the wisest policy to pursue. There are now thirty-three male and thirty-four female pensioners who receive respectively 42*l.* and 30*l.* per annum in monthly payments. Seven pensioners died during the past year, and burial allowances of at least 5*l.* were granted in each case. Widows of pensioners, if eligible under the rules, are placed on the pensioners' list. The Committee wishes to place on record its sincere regret at the loss by death of two generous contributors in the persons of the late Mr. Benjamin Hannen (father of the President) and Mr. George Jas. Lough. The warmest thanks and gratitude of the Committee are due to the President (Mr. Benjamin Hannen) for his generosity and that of his personal friends; to the Trustees (Sir Arthur Charles Lucas, Bart., Mr. J. Howard Colls, Mr. T. Stirling, Mr. F. J. Dove, Mr. J. T. Bolding, and Mr. T. F. Rider); to the Honorary Auditors (Mr. J. T. Bolding and Mr. R. J. Ward, F.C.A.); and to the dinner stewards for their services; and to the Worshipful Company of Tylers and Bricklayers for placing one of its almshouses at the disposal of the Committee for the benefit of one of the pensioners. The Committee is glad to announce that Mr. J. W. Chessum (Messrs. J. Chessum & Sons) has accepted the Presidency for the coming year. The annual dinner will be held in the Whitehall Rooms, Hotel Metropole, on Thursday, November 22 next, when the Committee hopes the friends of the Institution will give the Chairman their heartiest support.

The audited accounts for the year ending July 7, 1906, were read and adopted, and the following officers, etc., were elected:—

President, Mr. J. W. Chessum (Messrs. J. Chessum & Sons); Treasurer, Mr. J. Howard Colls; Executive Committee (re-elected), Messrs. C. Ansell, W. Brass, T. Hall, Hy. Holloway, J.P., W. Nicholson, Alfred E. Parker, Joseph Randall, F. Shepherd, T. Stirling, and Col. G. Haward Trollope, V.D.; (elected), Mr. Benjamin Hannen and Mr. H. Arthur Bartlett; Hon. Auditors (re-elected), Mr. Robert J. Ward, F.C.A., and Mr. J. T. Bolding.

Votes of thanks were then passed to the Past-President, Mr. Benjamin Hannen; the Hon. Treasurer, Mr. J. Howard Colls; the Trustees, Sir Arthur C. Lucas, Bart., and Messrs. J. Howard Colls, F. J. Dove, T. F. Rider, T. Stirling, and J. T. Bolding; the Committee of Management and dinner

stewards; the Vice-Presidents; the Hon. Auditors, Mr. Robert J. Ward, F.C.A., and Mr. J. T. Bolding

A vote of thanks to the Chairman closed the proceedings.

THE ARCHITECTURAL ASSOCIATION SUMMER VISITS:*

VI.—OXFORD.

THE sixth and final visit, which took place on Saturday, 7th inst., at Oxford, was in every way a fitting conclusion to an excellent series of summer outings. On this occasion the members of the Architectural Association were received by the Mayor at the Town Hall and shown over this important modern municipal building. Readers of the *Builder* will remember the competition for designs held some years ago, of which the selected plans, by Mr. H. T. Hare, were illustrated in our pages; and, later, some photographs of the executed building, on September 11, 1897. At the conclusion of the present inspection the Corporation mace and loving-cup were produced, and unanimously admired. The former is a beautiful specimen of XVIIth century English silversmith's work, said to be the largest of its kind, while the cup is solid gold of simple, yet interesting, form, presented to the borough by Charles II.

The remainder of the morning was spent in viewing various parts of the principal colleges, by courtesy of the Wardens, particular attention being paid to Christchurch Cathedral.

The afternoon was devoted to the study of modern work, and the party was driven to see the University new golf club-house. This is a pleasing building, designed by Mr. Alfred, of Oxford, having on two sides a wide verandah. The principal room is a large hall, with a barrel-vaulted ceiling, and is lighted by lunettes. The effects of light and space are most satisfying. Continuing the journey, Radley College, one of the leading present-day public schools, was next visited, and here the guests were received by the Warden. The old and new buildings were described by Mr. Ryan Tenison, who is now making extensions to the school premises. The Warden's house is the original of the many scattered buildings, and dates probably from the earlier part of the XVIIIth century. A fine oak staircase and other decorative features are excellent examples of the period.

The chapel, by Mr. Jackson, R.A., has a magnificent Flemish altar-piece.

The schoolroom is a large tithe barn, re-erected from an adjacent site, and enlarged by Mr. Tenison; it is a most interesting place, although perhaps the lighting is insufficient. Radley Church was finally visited, and is chiefly remarkable for a heavy oak nave arcade. The XVth century woodwork is beautiful, and extremely delicate.

The return journey was made *viâ* Oxford, and thus ended a most instructive day.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Alderman Evan Spicer, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee the following loans were approved of: Battersea Borough Council, 4,392*l.* for paving; Camberwell Guardians, 2,010*l.* for Poor Law purposes; Finsbury Borough Council, 2,500*l.* for street improvements; Islington Borough Council, 3,987*l.* under the Housing, etc., Act, 1890; Wandsworth Borough Council, 2,000*l.* for underground conveniences; and Woolwich Borough Council, 7,000*l.* for the acquisition of a wharf.

Rebuilding of Regent-street.—On the recommendation of the Building Act Committee, the Council approved of plans for the proposed rebuilding of Regent-street. The report of the Committee was given in our issue for the 7th inst.

Special Works—New Standing Order.—The General Purposes Committee recommended that the following be a standing order of the Council:—

"Any committee contemplating the execution of any work shall, before coming to a decision as to how the work shall be carried out, obtain an estimate from the proper officer. If the committee on receiving the estimate shall decide to recommend the Council to have the work carried out without the intervention of a contractor, they shall, before reporting to the Council, refer such estimate, together with the full plans and specifications, to the Works Committee for consideration. If the Works Committee express their willingness to carry out the work at the amount of such estimate, the executive committee shall thereupon take up a recommendation to the Council, at the same time submitting the full plans, specifications, and estimate of the proposed work, and such estimate, if approved by the Council, shall be called the 'accepted estimate.' Provided that, in the case of (1) petty works of current maintenance; (2) special works of a limited nature; (3) emergency repairs, which, if delayed, would cause accident to or deterioration of the property of the Council; and (4) the manufacture of special articles under the direction of committees of the Council, it shall be competent for the committee concerned to agree that such work shall be carried out under their own management by the direct employment of labour, on condition that they report the facts to the Council at the same time as the Works Committee make their half-yearly report to the Council."

This was agreed to.

Tenders for Painting.—A long list of tenders for painting schools was agreed to.*

The following recommendations were also agreed to: (*a*) That the resolution of July 10, 1906, so far as it relates to the acceptance of the tender of Maxwell Bros., Ltd., amounting to 619*l.*, for painting the interior of the Heber-road School (Dulwich), be rescinded.†

(*b*) That the tender of W. Johnson and Co., Limited, amounting to 623*l.*, for painting the interior of the Heber-road School (Dulwich), be accepted.

Additions, etc., to Selected List of Contractors.—The following recommendations of the Education Committee were agreed to:—

"(*a*) That the names of the undermentioned firms be added to the selected list of contractors for new schools, enlargements, structural alterations, repairs, cleaning, and painting, subject to the condition specified in each case:—Thomas J. Hawkins & Co., 109, Victoria-street, works not exceeding 10,000*l.*; G. Everitt, Windmill-road, Croydon, works not exceeding 5,000*l.*

(*b*) That the names of the undermentioned firms be added to the selected list of contractors for structural alterations, repairs, cleaning, and painting, etc., subject to the condition specified in each case:—J. & W. Drake, 195, Hammersmith-road, works not exceeding 3,000*l.*; E. Mills, Siebert Works, Westcombe-hill, Blackheath, works not exceeding 3,000*l.*; A. J. Staines, 154, Great Tichfield-street, works not exceeding 2,000*l.*

(*c*) That the names of E. J. Wallis, 3, Clarendon-road, Lewisham; and Randall & Ball, 66, Drayton-park, Highbury, be added to the selected list of contractors for small contracts for cleaning and painting for one year on probation.

(*d*) That the names of the undermentioned firms be added to the selected list of contractors for heating apparatus, subject to the condition specified in each case:—Lee & Warren, 7, Victoria-street ——; Hendry & Pattison, Ltd., 11, Hills-place, Oxford-street, works not exceeding 500*l.*; Cannon & Hefford, 77a, Stanbury-road, Peckham, works not exceeding 500*l.* for one year on probation.

(*e*) That the name of Boulton & Paul, Ltd., of Rose Lane Works, Norwich, be added to the selected list of contractors for the erection of iron buildings.

(*f*) That the name of McVey & Co., of 363a, Kennington-road, be added to the selected list of contractors for providing and fixing iron staircases.

(*g*) That the name of Cakebread, Robey, & Co., of 86, High-street, Stoke Newington, be added to the selected list of contractors for the supply of plumbers' goods.

(*h*) That the name of the Reservists' Employment Corporation, of 44, Pentonville-road, be added to the selected list of contractors for window cleaning so far as small contracts only are concerned.

(*i*) That G. A. Dean, of Dulwich Village, be allowed to tender under the style of W. J. Mitchell & Son for building works, including cleaning, painting, etc., not exceeding 5,000*l.* in value for one year on probation.

(*j*) That W. G. Cannon & Sons, Ltd., 107, London-road, be allowed to tender as hitherto for heating and the supply of gas services and fittings.

(*l*) That F. & H. F. Higgs, of Station Works, Hinton-road, Herne Hill, be allowed to tender for any new works estimated to cost over 10,000*l.*"

Insanitary Non-Provided School Buildings.—The following report of the Education Committee was carried:—

"We regret to report that the question of the sanitary condition of certain non-provided schools has now become so urgent as to require immediate and serious action by the Council. The Council on May 30, 1905, required the managers of 351 non-provided schools to carry out alterations and improvements to their buildings at dates varying in different circumstances, but in most cases fixed at December 31, 1905, July 31, or December 31, 1906. At the same time the Council declared that 108 non-provided school buildings were unsuitable for the purposes of elementary education, and that they could not be made suitable.

The position of affairs now is that the requirements have been carried out in about thirty instances, that part of the Council's requirements have been carried out in about 100 schools, and that fifty schools have been or are about to be closed. With regard to about 279 of the 459 schools concerned, we have no information that any portion of the requirements has been carried out, although in a large proportion of these cases the date assigned for the conclusion of the work is past or has been nearly reached, and the Council is still maintaining the schools. The Council has no legal power itself to incur any expenditure whatever on the improvement of non-provided school premises, and has no legal remedy in case of default by the managers in carrying out its reasonable requirements, except by refusing further to maintain the school.

We do not think that the Council will desire to refuse at once to maintain the large number of non-provided schools concerned, if only for the two reasons that the Council has not made provision by new accommodation for the tens of thousands of children who would be displaced, and that the introduction of an Education Bill has brought about a situation in which the Council will desire to avoid anything like extreme action. The Council has during the last few months foreborne to press for general improvements to non-provided school premises, however desirable in themselves.

The situation is, however, much more difficult in those cases where the sanitary condition of the schools is such as to constitute an immediate danger to the health of the children concerned. A report has been prepared by our direction on these schools where the survey of 1904-5 showed that the offices and drains were in a seriously insanitary condition. This report shows that the cases may be divided into four main classes (omitting those in which we are making further inquiries). The first class consists of ninety-eight schools where such a report was made as to the dangerous condition of the sanitary arrangements as to throw a heavy responsibility on the Council if it permits their further continuance. The second class consists of thirty-seven schools, in which the sanitary condition disclosed by the survey, though less serious, is still such as to make it imperative to press on the managers the necessity for taking immediate steps to remedy it. The third class consists of nineteen schools, the sanitary condition of which the Council was not able to ascertain at the time of the survey, owing to the refusal of the managers to permit the inspection required by the Council. The fourth class consists of schools where the sanitary repairs, though desirable, are not so urgent as to prevent them from being treated in the same way as are the other improvements required by the Council.

The first class consists of ninety-eight schools with a roll of 43,282 children, places for 20,348 of whom can be found by filling the halls of the neighbouring London County Council schools, but this will put a strain upon the accommodation of the districts concerned, which must re-act seriously on the general educational work of the Council. The second class consists of thirty-seven schools, with a roll of 17,851, 5,414 of whom by similar means can be accommodated. The third class consists of nineteen schools, with a roll of 8,667, of whom 1,655 can be accommodated. If, therefore, all the schools in these three classes were closed, 69,300 children would be displaced, of whom only 27,417 could be accommodated elsewhere, leaving 42,383 children for the continuance of whose education no provision would have been made. The Council is faced with a choice of evils. Either these children must be deprived of any education whatever, or their education must be carried on in insanitary premises.

In these circumstances we think that the Council will be unwilling to take the extreme step of turning out children for whose accommodation elsewhere no provision has been made, unless the danger to their health involved in continuance in their existing premises is both serious and immediate. We think, therefore, that in dealing with schools in the first category the Council should only announce its intention of withdrawing maintenance in those cases where a further examination of the premises by the smoke and chemical tests shows actual and dangerous contamination of the air breathed by the children, and where such notice has been given to the managers of this inspection as shall enable them to make the repairs most urgently required. The managers alone are legally entitled to make such repairs, and we hope that an appeal to them may not be without result. In cases where nothing is done we shall be compelled to recommend the Council to close the schools in the autumn, however great may be the moral and educational loss involved.

With regard to the third class, we think that the Council should at once communicate with the managers, pointing out the seriousness of the situation, the character of the tests with which it is proposed to meet the emergency, and announcing its intention to use these tests. If the managers refuse to permit these tests, we think that the Council should report the matter to the local sanitary authority, and leave with that authority the responsibility of dealing with the situation, whether by closure of the school or otherwise. Should the Council adopt our proposals, it will be necessary to authorise the engagement of additional temporary assistance to carry out the work of testing at an expenditure not exceeding 250*l.*, sufficient provision for which has been made in the maintenance estimates, 1906-7. We recommend:—

(*a*) That in the case of the schools named in the statement separately submitted by the Education Committee, the urgent and immediate attention of the managers be drawn to the requirements of the Council sent to them in 1905 with regard to the sanitary condition of their schools, and that they be informed that without prejudice to any of such requirements the Council proposes to apply after the summer holidays the smoke and chemical tests to the offices and drains of their schools, and that if after the application of these tests it is found that the condition of the offices and drains constitutes an immediate danger to the children, the Council will cease to maintain the schools after October 19, 1906.

(*b*) That the attention of the managers of the non-provided schools enumerated in the statement separately submitted by the Education Committee, be drawn to the requirements sent to them in 1905, and that they be informed that, unless the work required of them by the Council in connexion with the offices and drains is carried out during the summer holidays, 1906, the Council will consider whether it shall cease to maintain the schools as from October 19, 1906.

* Unavoidably postponed from last week's issue.

* See our tender columns.
† At the firm's request.

(c) That the managers of the non-provided schools shown in the statement separately submitted by the Education Committee, be informed that the Council proposes to apply the smoke and chemical tests to the drains and offices of their schools, and that if permission to do so be refused the Council purposes to report that fact to the local sanitary authority in each case.

(*d*) That, subject to monthly reports by the architect (Education), as to their number and rates of pay, additional assistants be temporarily employed in the architect's (Education) department, in connexion with the inspection of offices and drains of non-provided schools, and that expenditure not exceeding 250*l.* be sanctioned therefor."

Having transacted other business, the Council adjourned.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses :—

Lines of Frontage and Projections.

Fulham.—Erection and retention of projecting porches and balconies in front of Talgarth-mansions, Talgarth-road, Fulham (Mr. A. Blackford for Mr. Marwood).—Consent.

Greenwich.—Buildings on the south side of Westcombe Park-road, Greenwich, between Mycenæ-road and Westcombe-hill (Messrs. Crickmay & Heath for Mr. C. Johnson).—Consent.

Lewisham.—A one-story building at the rear of No. 2, Springbank-road, Lewisham, to abut upon Duncrievie-road (Messrs. Jarman Brothers, Sons, & Co., Ltd., for Messrs. Abbott Brothers).—Consent.

Norwood.—Buildings on the western side of Tulse-hill, Norwood, northward of No. 6, with a one-story portion in front (Messrs. Goodwyn & Sons for Messrs. Higgs & Son & Mr. E. Tewson). Consent.

St. Pancras, South.—That the application of Mr. W. Flockhart for an alteration of the periods within which the construction of cellarage in the forecourts of Nos. 15, 17, 19, and 21, Euston-road, St. Pancras, was required to be commenced and completed, be granted.—Agreed.

Hampstead.—A conservatory building at No. 24, Quex-road, Hampstead, to abut upon Mutrix-road (Messrs. H. G. Lancaster & Co.).—Refused.

Kensington, South.—Buildings on the southern side of Brompton-road, Kensington, between Nos. 2 and 12 (Mr. H. Chatfeild Clarke for the Metropolis Estates Company, Ltd.).—Refused.

Strand.—Three cranes at Messrs. Spalding & Hodges' premises, Russell-street, Strand, two of such cranes to abut upon Drury-lane and one upon Crown-court (Mr. R. Waygood & Co. for Messrs. Spalding & Hodge, Ltd.).—Refused.

Wandsworth.—The retention of four one-story shops in front of Nos. 65, 67, 69 and 71, Westcote-road, Streatham (Mr. J. Harding).—Refused.

Width of Way.

Poplar.—A shed at the rear of No. 113, West Ferry-road, Poplar, at less than the prescribed distance from the centre of the roadway of Tooke-street (Mr. E. B. Ellis for Mrs. Padwick).—Consent.

Lines of Frontage and Space at Rear.

Hackney, North.—Four buildings on the western side of Wordsworth-road, Stoke Newington, and with an irregular space at the rear of the northernmost building (Mr. J. H. Mellenfield for Messrs. J. Stapleton & Sons).—Consent.

Lines of Frontage and Construction.

Norwood.—An iron and glass shelter of a temporary character in front of No. 160, Knight's Hill-road, Norwood (Messrs. Parr & Sons for Mr. Carl Hentschel).—Consent.

Lewisham.—The retention of a cycle house at the side of No. 2, St. Fillan's-road, Catford, abutting upon Elmer-road (Mr. F. Diss).—Refused.

Space at Rear.

Chelsea.—A modification of the provisions of sect. 41 with regard to open spaces about buildings so far as relates to the proposed erection of a building on the eastern side of Tite-street, Chelsea, on land belonging to Rayleigh House (Mr. G. Sherrin for the Hon. R. Strutt).—Consent.

Lewisham.—A modification of the provisions of sect. 41 with regard to open spaces about buildings, so far as relates to the proposed erection of No. 27, Crofton-terrace, Brocklev-road, Lewisham, with an irregular open space at the rear (Messrs. Tompkins & Connew for Mr. G. Dean).—Consent.

Marylebone, West.—A modification of the provisions of sect. 41 of the Act so far as relates to the proposed erection of an additional story to No. 42A, Great Cumberland-place, St. Marylebone (Mr. J. H. Ball for Mr. Gustav Aguet).—Consent.

Formation of Streets.

Wandsworth.—That an order be issued to Messrs. Milner, Son, & White, sanctioning the formation or laying out of three new streets for carriage traffic upon the Furzedown-park estate, Tooting.—(Consent).

Woolwich.†—That an order be issued to Mr. A. E. Habershon sanctioning the formation or laying out of a new street for carriage traffic to lead from Heathfield-terrace to Swingate-lane, Plumstead.—Consent.

Hampstead.—That an order be issued to Mr. R. J. Worley, refusing to sanction the formation or laying out of a street for carriage traffic to lead out of the eastern side of West End-lane, Hampstead (for the Midland Railway Company).—Refused.

Buildings for the Supply of Electricity.

Wandsworth.—For the construction of an accumulator house at the generating-station, The Causeway, Wandsworth (Mr. C. Thompson for the County of London Electric Supply Co., Ltd.).—Consent.

Alteration of Buildings.

St. George, Hanover-square.—The formation of an opening in the party-wall between a shop on the ground-floor of No. 1, Albemarle-street, St. George, Hanover-square, and the staircase leading to the upper floors of such building (Mr. F. T. Verity for Messrs. Gresham, Barber, & Co.).—Refused.

The recommendation marked † is contrary to the views of the local authority.

THE ROYAL SANITARY INSTITUTE CONGRESS.

IN addition to the papers and discussions at the Royal Sanitary Institute Congress at Bristol last week, the following subjects were dealt with at the second sitting of the Engineering and Architecture Sections held at University College on Thursday under the chairmanship of Mr. A. P. I. Cotterell (Bristol) :—

Rural Water Supplies.

Dr. E. F. Willoughby (London), in a paper on "Rural Water Supplies," first dealt with the law on the matter, and, passing on to the inadequacy of the supplies in many places, said there are countless villages in all parts of the country on pervious soils, alluvial, tertiary, chalk, sand, or limestone, where shallow wells yield an abundant and perhaps a constant supply. Each cottage has its well, but each has also a privy within a few feet of the well, in more or less pervious soil, so that the liquid soaks downwards into the ground water or directly into the well. Such pollution, if poured on the surface of the ground, would, in percolating through the upper soil, undergo complete nitrification, but starting from a point 6 ft. or 10 ft. below the surface, where the earth is devoid of bacteria, or what Dr. Poore called "dead," it is, though clarified, not purified, and makes all such wells a source of danger. The greatest difficulty is encountered in places where the soil consists to a depth of from 100 ft. to perhaps 400 ft. of dense homogeneous clays, in which there are no water-bearing strata. Such are frequently met with on the formations known as the Gault and the Kimmeridge and Oxford clays. Here it is necessary to go beyond the immediate vicinity, which neither the owner nor the local authority can do, and the only remedy lies in a resort to the County Council, on which rather than the local authority the supreme responsibility should devolve. The County Council should be empowered to authorise or compel the formation of water boards for the supply of combined districts devoid of means of supplying themselves. Shallow wells will always be a source of water for a large part of the population, and if cesspits were abolished and the wells raised 12 in. or 18 in. above the ground-level so as to prevent the entrance of surface drainage, vermin, etc., there is no reason why they should not be perfectly safe.

Mr. W. Whittaker opened the discussion, and said that the great difficulty in connexion with water supplies was want of money. It was comparatively easy to devise a scheme for a large city where a few thousand pounds more or less did not matter, but a very different thing in a rural district, where the rateable value was low. In many cases they must be content with shallow wells, and he agreed with the author that they might be made very good. If they were built up somewhat from the surrounding ground a great deal of pollution would be avoided. He was afraid the author went a little too far in advocating the abolition of cesspits, for, while theoretically it would be a good thing, yet it could not be done, and all they could do was to see that the cesspit was put in such a position that it could do no harm. What could be done more in rural districts was for several villages close together to combine to get a supply. One source of supply was the rain, and rain-water was not so bad. It was not always pleasant to drink, but it was wholesome, and it was certainly far better than a pond supply.

Mr. A. F. Somerville (Wells) pointed out that a great grievance with rural districts was that large cities came and took their supplies from a country district and drained the whole area. Wells were drained, and the whole source of supply taken away. If the present law was enforced by the Local Government Board a great many of the difficulties that rural districts suffered from would be avoided. He had supplied cottages with a rain-water supply by having a tank over the door which served also as a porch, and there had been no difficulty at all.

Miss Cochrane (Rural Housing Association) observed that the Rural District Committee had neither the means or the knowledge of undertaking water supplies, and she suggested that it should be placed in the hands of wider authorities—either County Councils or a State Department.

Mr. Lea (Truro) remarked that there was a little difficulty in determining what was wholesome water, and said that in a number of samples sent for analysis a large proportion of nitrates were found, and yet there were no evidences of zymotic disease, although it was evident that there was water pollution.

After some further discussion the Chairman said that rural authorities were much more alive to the necessity of improving the water supplies of their districts, and such discussions as that must be a help to the community. The fact that the death rate in the country was higher than that of the towns was no doubt due to the water supply. If more powers were given to the County Councils and more energy shown by those who had to do with the health of the community, he thought the health of county districts would be much improved.

Dr. Willoughby, in reply, expressed his view that deep wells were more in danger from percolation than shallow ones. A deep chalk well within his knowledge was one of the most suspicious he knew of. It was the percolation through fissures at great depth which was dangerous.

Light in Dark Rooms.

This was the subject of a paper read by Dr. S. Davies (Medical Officer of Health for Woolwich), in which the author pointed out that, although the fact that light is necessary to health is so generally recognised, yet there is no definite provision in the Public Health Acts for ensuring that dwelling and work-rooms are properly lighted. The only way in which dark rooms can be dealt with is by declaring them to be in such a condition as to be a nuisance or injurious to health, and the Woolwich Borough Council had enforced this section and obtained a conviction. Having touched on the principal causes of darkness, Dr. Davies gave instances of how light has been supplied in his own borough. These were (1) the use of whitewash for the surface of areas, adjoining and opposite walls, and interior surfaces, although for areas coating with glazed bricks are preferable; (2) the use of certain kinds of glass which are highly refractive; (3) where there are forecourts slope off the area at a larger angle; (4) the enlargement of windows; (5) removal of trees, etc. The London County Council had been considering and has proposed amendments to the Building Act which will remove some of the difficulties, but it appeared to him that the only satisfactory way of ensuring that the dwelling-rooms of new houses are sufficiently provided with the means of lighting by daylight is to enact that no new house shall be occupied unless each habitable room is certified to be properly lighted by daylight. As regarded old houses, what was wanted was a further definition of nuisance as "any dwelling-room not provided with sufficient and proper means of lighting by daylight."

Mr. Osborne Smith (London) said they frequently saw in new buildings, as well as old, windows 1 ft. or 2 ft. below the ceiling, and any room in which that occurred would be infinitely better from the health point of view if the windows were against the ceiling.

Mr. Thomas (Mountain Ash) mentioned that a difficulty in his district was that to get the superficial area the windows were made wide instead of high.

Mr. W. Duck (Folkestone) advocated the passing of by-laws by which the size of back additions to houses should be restricted to, say, one-third of the width of the house.

Dr. Davies, in reply, said he believed that on the large Corbett estates and on other estates recently developed around London they had no back additions, and he hoped the time would come when such additions would never be erected.

Cremation; Its Bearing on Public Health.

Mr. Albert C. Freeman submitted a paper on "Cremation; Its Bearing on Public Health." He remarked that the object of placing a dead body beneath, rather than upon, the surface of the ground, is that the earth may absorb and neutralise the products of gradual decomposition. This result is very imperfectly accomplished. Investigation showed that the earth does not purify the body placed in it, but that, on the contrary, noxious gases escape into the atmosphere, and germs of specific diseases are incorporated with the water which percolates from a cemetery, so that the air and the water are polluted, to the serious danger of the living. Sanitary science has taught us truths so important as to the pernicious effects of placing the bodies of our dead in the earth, that, if we were not in daily contact with the blind conservatism of the human race, we should be surprised that this method was not long ago supplanted by some other system which would effect quickly and advantageously that which goes on in the grave slowly and mischievously. The author proceeded to trace the history of cremation, and said that there are at present in operation thirteen crematoria in this country. With regard to the preservation of the ashes, if such preservation served no good purpose it could not possibly do any harm. If the urns are deposited in our churches they will decorate the building, and also lead to the adoption of the old custom of bringing the remains of the dead within the Church of God.

Isolation in Fever Hospitals.

Mr. T. W. Aldwinckle dealt with the question of isolation in fever hospitals, and gave particulars of the new departure which is being made by the managers of the Metropolitan Asylums Board. This new departure relates to the isolation of patients suffering from, or suspected to be suffering from, scarlet fever, diphtheria, or some other infective disorder. The Board have decided that the cubicle system of isolation in incoming patients is the most suitable. The author proceeded to deal with the cubicles at the South-Western Hospital. These are arranged on each side of the two existing wards, having a corridor in the centre. The ward is 100 ft. long, 28 ft. wide, and 14 ft. 6 in. wide. The ward originally contained eighteen beds, and, as there will be sixteen cubicles, there will be a loss of two beds, or 11 per cent. As a rule, the loss of beds under the new arrangements will work out at about 15 per cent. Each cubicle will have a floor area of about 120 ft. The partitions are 7 ft. high, and go close down to the floor. The raising of these partitions a few inches clear of the floor for the purposes of air circulation has this serious disadvantage, that children (who are the majority of patients) might pass articles to each other through this space. The partitions are of 2-in. steel framing, the lower portion filled in with asbestic panels, the upper portion, commencing about 2 ft. from the floor, being glazed with 32-oz. sheet-glass. Plate-glass would be preferable. The partitions will stand upon hard-wood fillets, rounded on both edges so as to avoid a bad angle against the floor. The finish against the walls will be similar. The cubicle partitions are therefore absolutely fire-resisting—a matter of vital importance where patients are individually isolated. The doors will be dwarf doors 3 ft. 2 in. high, sufficiently high to prevent a child from getting out of the cubicle, and low enough to admit of a free current of air. Gilmour doors will be used, which, being of hard wood, are practically fire-resisting. The doors are so placed that the door of one cubicle is not opposite that of another cubicle. Each cubicle has one large ward window with double-hung sashes, and hopper sash over. As the floors of these wards are of deal, thirty-five years old, we are replacing them with teak floors. There are hot-water heating pipes running round the wards which will be sufficient to warm the cubicles, while the corridor and the general air space above all will be warmed (in addition) by the central fireplaces, which will also act as exhaust ventilators. There are fresh-air inlets in the external wall of each cubicle. There will be ample cross ventilation by means of the windows. The arrangements for ensuring a condition of perfect asepsis on the part of the doctor and nurse will be upon the same lines as those at the Pasteur Hospital. The author next dealt with the proposed cubicles at the South-Eastern Hospital, where the arrangements are similar to those at the South-Western Hospital, except that there are no central fireplaces. It is estimated that the cost, including the spray lavatory, will not exceed 30*l.* per cubicle.

Isolation Hospitals in Rural Districts.

Mr. J. Cooke Hurle (Somerset County Council) had prepared a paper on "Isolation Hospitals in Rural Districts," which was taken as read, in which he pointed out that, owing to the small rateable value of country districts and the fact that an isolation hospital was often without patients for a considerable time, the type of hospital which the Local Government Board endeavoured to force on country districts is a type which the country districts will seldom voluntarily agree to erect. The author described in detail an isolation hospital of a different type erected in a rural district in North Somerset thirteen years ago. A case of small-pox occurred in 1893 in the capital of the district, a county town of 3,000 inhabitants. The sanitary authority erected, as rapidly as possible, an iron block with kitchen and nurses' room, and two wards designed for six patients each, water-closets, and bathrooms: a detached iron cottage, and a third building (also detached) to house a steam disinfector and ambulance, and to serve (if necessary) as a mortuary. Gas and water had to be laid on from some distance, and sewage disposal was effectually provided by sub-irrigation, solids as well as slops being thus dealt with. In the first instance, six beds for patients were provided; and the total cost up to this point was 732*l.*, which included road-making and fencing. There was no payment for land, as the field in which it was erected was already the property of the guardians. Soon afterwards a small iron building for laundry purposes was erected, and from time to time beds were added until the number reached twenty. These brought the cost to about 900*l.*, or about 45*l.* per bed. The present staff consisted only of a caretaker and his wife, who looked after the building when it was unoccupied and kept it in readiness for immediate use. Arrangements were made with a local medical practitioner to give medical attendance when the hospital was occupied and a nurse or nurses were obtained. The hospital has been most successful in stamping out several epidemics, and no death has yet occurred in the wards.

The discussion of Mr. Aldwinckle's and Mr. Hurle's paper was taken together.

Mr. Saxon Snell said that he had had occasion to study the plan of the Pasteur Hospital pretty closely a year or two ago, and was not much impressed with it. The French and Germans, and, indeed, none of the Continental countries, seemed to have grasped the details of sanitary work as they had in England. It was one of the few points in which we were in advance of them. The staircase in the plan seemed to him to be in the wrong place, for two people might be passing one another and infect one another. In Mr. Aldwinckle's case, he supposed he had to alter old walls, and therefore had a central passage, the same as in the Pasteur Hospital. The most ideal plan on the surface appeared to be that adopted at the Walthamstow Hospital, where the wards were entered from the balcony outside. He would like Mr. Aldwinckle to say whether, if he were building a new hospital, he would adopt the Walthamstow plan. Reference had also been made to the Hospital for Sick Children in Paris, where the partitions only came down to within 2 in. of the floor, and he would like to know if they had an exhaust fan powerful enough to draw out the air without it passing from one room to another. Further, he would like to know how Mr. Aldwinckle arranged in his wards so that the air did not pass from the cubicles into the corridor, and from the corridor into another room.

Dr. Neech (Halifax) considered that the arrangements being made by the Metropolitan Asylums Board were a step in the right direction. He had been much struck by the way in which at the Pasteur Hospital they nursed diseases of various kinds next to one another. That the hospitals in this country as at present arranged were a success could not be said. At the same time he doubted if the cubicle system were universally adopted if they would be able to stamp out scarlet fever. In the Pasteur Hospital they were not cubicles but cells, and he considered this a more efficient means of isolation.

Mr. J. Pearson (Folkestone) quoted the experience of various towns in proof of his contention that the hospital system had proved a complete failure to stop the spread of infectious disease.

Mr. Brownridge (Birkenhead) did not see why the Local Government Board should not give short-period loans for corrugated-iron buildings, for he knew from experience that if properly attended to they would last twenty years. He favoured the cubicle system in infectious hospitals.

Mr. Lambie (Lanarkshire), Dr. Martin, and Dr. Vallentine all spoke in controvertion of the suggestion by Mr. Pearson that the system of infectious hospitals was a failure.

Mr. Windley (Leicester) said that corrugated-iron buildings in his town had been in existence and used for hospitals for over thirty years.

A number of delegates have spoken on the purely medical side of the question.

Mr. Aldwinckle, in reply, said the question of whether cells would be better than cubicles was decided by the ten medical superintendents of the Metropolitan Asylums Board hospitals, and it was their opinion that the cubicle system was the better one. Cubicles were not only more economical in the first place, but they could be adopted in an existing ward. It was easy to ventilate the cubicles, but difficult to ventilate the cells, each one of which would have to be ventilated on its own account. As to the point raised by Mr. Saxon Snell, whether he would adopt the planning at Walthamstow in the case of a new hospital, in that institution the cellules were placed back to back, and the admission to each was from the external verandah. In adopting such a course they considered they lost the advantage of through ventilation, which in this climate was, after all, about as complete and satisfactory a way of ventilating wards as they could possibly have. Further, it was a bad thing for the nurses to have to go outside continually from a temperature of 62 to a temperature possibly of 40 during some months. The wards they were adapting to the cubicle system were thirty-five years old. His experience was that they could put up corrugated-iron buildings at an economical cost for isolation wards, if they took care that they were not inflammable. They would last twenty-five or thirty years, and for all practical purposes the hospital was as efficient as one built of brick and stone.

Conference of Sanitary Inspectors.

On Wednesday a conference of sanitary inspectors was held at University College, presided over by Mr. A. E. Hudson.

The President in his address said there could be no doubt as to the necessity of the systematic supervision of dwellings and workplaces by sanitary officials, and local authorities through their officials could put into force the powers they possessed to provide against overcrowding, to secure good ventilation, access of light, and freedom from damp in all dwellings or workshops. In the houses of the people the efforts of the sanitary officials had been directed to securing for the inmates sweet, clean, healthy houses, and he felt that the best results of their work was to be found here. The housing of the poor was far from being satisfactory in any town or city. Bad housing was recognised as one of the principal causes of the existing vice and wretchedness of the poorest poor. He did not suggest that there was

no housing question in respect of the artisan, but his experience led him to think that the urgent problem which faced them had reference to the housing of the poorer labouring classes. This could only be made by some sacrifice on the part of the ratepayers. The dwellings of the poor required to be improved in several particulars, but the main particular was in regard to size. The limit of air space generally agreed upon as that below which legal action should be taken to abate overcrowding, viz., 300 cubic ft. of sleeping space for an adult and half that for children under ten years of age, was not sufficient for habitual occupation if they were to expect good health. What was required was to build good-sized houses with three or more bedrooms to accommodate families consisting of four to eight children, and to let them at rentals of 1s. 6d. to 3s. per week, and to meet this real want local authorities must be prepared from the outset to subsidise such properties from the rates.

On the motion of Mr. Wilkinson (Derby), seconded by Mr. W. Jackling (Maidstone), a vote of thanks was passed to the President.

Practical Training for Sanitary Inspectors.

Mr. W. W. West (Walthamstow) contributed a paper on "Practical Training for Sanitary Inspectors before Certification," in which he reviewed the opinion which has been expressed in the past on the subject. He pointed out that an authority requiring a clerk, surveyor, or accountant looked for him amongst those who had not only a theoretical knowledge but who had also acquired practical experience as a subordinate in one of those departments, and there could be no objection to a similar arrangement for those who have to be certified as qualified for inspectors. If examining authorities were determined to bring this about it could be done, and if both of them insisted that only those shall be certified who have the training indicated arrangements could soon be made to that end.

Sanitation: Past and Present.

In a paper under this title Mr. T. J. Crofts (Bristol) said that, although sanitary progress and the advancement of public health have made great strides under existing Acts of Parliament, there still remained a great work to be performed by sanitary reformers. It was unfortunate for the community that sanitary authorities in provincial towns are still without any definite power to compel those who are responsible for the execution of drainage works to give them notice before proceeding to execute work necessary for the abatement of nuisances. We also urgently required by-laws to regulate the construction of drains for existing buildings. The London County Council has power to draft by-laws for regulating the construction of drains in new and existing buildings, and to require notice and plans, together with particulars of any proposed works. By-laws of this description are required throughout the country, which would raise the standard of sanitary work in our dwellings; we wanted by-laws which would secure uniformity of sanitary inspection throughout the kingdom. The important duties which sanitary inspectors are now called upon to discharge demand that only qualified persons should receive these appointments. There was no class of public officers who require protection in the performance of their duties more than the sanitary inspectors. Many appointments are held during the pleasure of the sanitary authority, and, owing to the insecurity of tenure of offices, renders it difficult in many instances for inspectors to discharge their duties satisfactorily; all appointments should be permanent, and only be dismissed for misconduct or proved incompetency, with right to appeal to the Local Government Board. The public had learnt to appreciate and have grown into sympathy with sanitary inspectors, and he was regarded as the friend and adviser of the people amongst whom he moves.

Status of a Sanitary Inspector.

Mr. J. A. Sutton (Nottingham) in the course of a paper on the above subject, pleaded strongly for more technical training on the part of those who were entrusted with the duties of a sanitary inspector, and, speaking as one who was formerly a mechanic, said he knew how objectionable it is for an incompetent person in authority to come round and make absurd and impracticable suggestions, and nothing tended to increase the contempt and lack of respect on the part of the practical workman than a display of ignorance by those placed in authority above them. A still more important aspect of the question was this. Their work very often called for joint action between the inspectors and other public officers, viz., engineers, surveyors, architects, and others who were men who had to qualify for their position by an apprenticeship extending over a number of years. If sanitary inspectors were to hold their own with the members of allied professions, both as regarded social standing and qualification, it was desirable that some different system of training should be formulated whereby they might hope to secure that position which was desired by all members of the profession. At present the sanitary inspector's certificate was held by many persons who had never served an hour's apprenticeship to a trade connected with building construction, which, in his opinion, was a most necessary qualification, for how could they expect such a person to superintend and carry out any duties in connexion with drainage, plumber's work, and so on.

Public Health Act.

Mr. C. Machonon (Torquay) discussed the question of the definition of "drain" and "sewer" in a paper on "Some Amendments to the Public Health Act, 1875." He suggested that perhaps a more practical meaning might be suggested to the section "Drain," as "any drain used for the drain of one or more buildings which runs under buildings or through private lands or premises to which the local authority has no right of entry, and which drain was laid for private profit."

Uniformity in Sanitary Work.

Discussing the want of uniformity in the carrying out of sanitary work, Mr. A. E. Bottomley in a paper treated the subject under the heads of (1) Administrative Bodies, (2) Officials, and (3) the Practical Side of Their Duties. He suggested that a new Public Health Act is required to consolidate former Acts and to meet modern requirements; that a Minister of Health is needed, a protection period for sanitary officials, and appointments to depend on merit and examination; and that, with regard to the practical side of the official's duties, the by-laws of the London County Council would form a good basis.

Physics, Chemistry, and Biology.

This Section met on Thursday and Friday, under the presidency of Mr. W. N. Shaw, when papers on a variety of subjects were discussed.

Influence of Dust on Health.

Dr. P. Boobbyer (Nottingham) introduced the above subject, and to mitigate the undoubted and dangerous dust nuisance of the cities he suggested, amongst other things, that the streets should be paved, as far as practicable, with smooth and cleanable material; dry sweeping of the streets should be stopped, and closed carts used for scavenging purposes; the pursuance of a vigorous campaign against the smoke nuisance; the enforcement of the use of closed bins for the storage of domestic refuse; and the construction of buildings of such materials and upon such principles as should obviate, as far as practicable, the accumulation of dust beneath the floors.

Pollution of Water Supplies.

Dr. S. Rideal read a paper on "Prevention of Growth of Algæ in Water Supplies." He pointed out that the fouling of reservoirs and conduits in waterworks by various growths is a problem that has frequently to be dealt with by the water engineer, and, although it has not attracted general attention in this country, in America, and especially in tropical climates, this contamination of large volumes of water is often a serious matter, and on the Continent several State Commissions have had to deal with this subject. The contamination frequently consists of one, or several, of the very numerous algæ, many of which, besides causing the clogging of valves, etc., and an unsightly appearance, are capable of imparting disagreeable odours and tastes. Trials have been made to destroy or inhibit the growth of the plants by the addition of a minute quantity of a germicidal substance to the water. The author proceeded to consider the successful attempts to deal with the nuisance at Newport and Gloucester by means of crystallised sulphur copper, and suggested that the use of electrolytic chlorine solution gave indications of success, and the advantages of such a solution over that of a poisonous element, such as copper, were obvious

Mr. Read (Gloucester) said that in his town the growth of algæ at the bottom of the reservoirs produced a fishy taste to the water, and some ten years ago, after consultation with the city analyist, he tried sulphate of iron. This apparently killed the growth, but the following year there was an increased growth. Last year he tried sulphate of copper in the proportion of one in 3,000,000. He crushed the crystals up to the consistency of sugar and scattered it on the surface of the water. Within a few hours a fishy smell could be discerned arising from the water, and this continued for twenty-four hours. The analyst made careful tests, and in forty-eight hours no trace of copper could be found by the most delicate tests. Since then they had had no trouble from the smell or fishy taste of the water, and he thought that probably one treatment a year was all that would be required.

Mr. Smith (Kettering) asked whether, after the treatment, there was less difficulty in succeeding months in keeping the filters free. It appeared to him that such a treatment might be most economical.

Mr. Read said they had no open sand filters, but used a mechanical filter, which had been in action for five years. They found that after the treatment by sulphate of copper in the reservoirs these filters required much less cleaning than before.

Dr. Willoughby remarked that he had used sulphate of copper where there was a great deal of growths in an ornamental pond, and the growths had not returned since. He asked for some idea of the cost of using chlorine solution.

Dr. Rideal said if only one treatment a year was required it would probably be more economical to use sulphate of copper. For applications of chlorine most waterworks had the power available. A small electrolytic plant would cost about 100*l.*, and could be easily connected up with the power available at a waterworks, and, of course, they would always have it.

Medical Officers' Conference.

At the Conference of Medical Officers on Thursday it was agreed, on the motion of Dr. H. Meredith Richards (Croydon), "That in the opinion of this Conference it is desirable that the County Councils be enpowered to form Joint Water Boards and Joint Drainage Boards on similar lines to the powers already possessed in connexion with isolation hospitals."

"Drain" and "Sewer."

Dr. John Robertson (Birmingham) moved: "That, in the opinion of this Conference, the time has arrived when the definitions of the words 'drain' and 'sewer' in the Public Health Acts and the Metropolis Management Act should be amended." Dr. Robertson said the difficulties in defining what was a sewer and what was a drain gave almost daily trouble, and in a recent book by Mr. Macmorran, 800 pages were devoted to legal decisions on the subject. The speaker hesitated to append to his resolution a definition, but said his own feeling was that owners of drains ought to look after drains or sewers which existed in their properties, while the local authorities looked after drains or sewers which were under the public streets. That seemed to be a fair give-and-take arrangement.

Mr. Snaith (Birkenhead) contended that the decision of the High Court was absurd.

Dr. Davies observed that they had solved the question in Bristol by a section in a recent local Act, and no difficulty had arisen.

The resolution was carried.

Certifying New Houses.

Dr. S. Davies (Woolwich) discussed in a paper the desirability of forbidding occupation of new houses until certified to comply with certain sanitary conditions. He suggested that it was worthy of consideration whether it is not desirable and practicable

to enact that no house shall be occupied until it is certified to comply with certain sanitary conditions, *e.g.*, in addition to having a proper and sufficient water supply, that the habitable rooms are sufficiently lit and ventilated, and that the house is properly protected from dampness; that the walls and floor are actually dry, and that due provision is made for sanitary conveniences. There is no doubt that the requirements of such a certificate would be a great advantage from the public health point of view. It is not necessary at present to decide what officer shall give the certificate; this might be left to each district to settle. It might be arranged that the Surveyor, in the first place, should give a certificate that the house complies with the building regulations in force in the district, and the Medical Officer of Health might certify that in other respects the sanitary conditions are satisfactory. If the Surveyor charged with the enforcement of the building regulations were required to give a certificate that the sanitary provisions had been carried out, he would no doubt be careful in supervising the plans of the house submitted to him, and in seeing that these provisions were carefully attended to. If a certificate were refused, the owner should be informed what works were required, and if he was unable or unwilling to do them, he should be allowed an appeal to a Police Court. If the Court considered that the requirements of the Sanitary Officer were unreasonable they would have power to permit the occupation of the house. The Court might also have power to allow occupation of the house in an emergency, but, at the same time, to make an order that the works required should be carried out. No doubt there are practical difficulties in the way of the suggested certification, but, in the opinion of the writer, the advantage to be gained is so clear as to outweigh any possible objection.

A resolution in favour of the author's suggestion was carried.

Other Conferences held during the Congress were "Women on Hygiene," "The Hygiene of School Life," and by the Veterinary Inspectors.

Competitions.

ANNFIELD PLAIN FREE LIBRARY.—A meeting of the General Committee for the establishment of a free public library for the Urban District of Annfield Plain was held recently at the Council Offices, Hare Law, to consider the competitive plans submitted for the proposed building. The sealed envelopes were opened, when it was found that the design approved was that of Mr. Edward Cratney, of the firm of Davidson & Cratney, Willington on-Tyne. Mr. T. E. Taylor, Lanchester, was second, and Messrs. Boyd & Groves, Newcastle, third.

JOINT ISOLATION HOSPITAL, STONE, STAFFORD.—The assessor, Mr. William A. Pite, F.R.I.B.A., has issued his award in this competition, placing the design submitted by "Simplicity" first. This was found to be Mr. J. J. Chapman, of Stone, Stafford. The award has been adopted. The following is a list of the remaining competitors, in alphabetical order: "Æsculapius," Messrs. Jones and Hilton (Burslem); "Buscotte," Mr. R. Arrowsmith (Stone); "Economy," Mr. A. P. Miller (Hanley and Stone); "Fresh Air," Mr. J. S. Redman (Stoneleigh).

BRANCH LIBRARY AT HITHER GREEN.—The Libraries Committee of Lewisham Borough Council are to invite local architects to send in designs for the erection of a new branch library at Hither Green. The building is to contain reading and news rooms, and a separate room for juveniles, but no reference library nor caretaker's apartments. The total cost, including fixtures, fittings, architect's and quantity surveyor's fees, is not to exceed 4,500*l*.

BOOKS RECEIVED.

THE MANUFACTURE OF CONCRETE BLOCKS AND THEIR USE IN BUILDING CONSTRUCTION.—By H. H. Rice and W. M. Torrance. (Archibald Constable & Co. 8s.)

CLASS LIST AND INDEX OF PERIODICAL PUBLICATIONS IN THE PATENT OFFICE LIBRARY. Second Edition. (Patent Office. 6d.)

THE ANNUAL OF THE BRITISH SCHOOL AT ATHENS.—No. XI. Session 1904-1905. (Macmillan & Co. 21s.)

THE SMALL HOUSE: ITS ARCHITECTURE AND SURROUNDINGS. By Arthur Martin. (Alston Rivers. 2s.)

Correspondence.

BOARD OF EDUCATION EXAMINATION.

SIR,—I am directed by the Council of the Association of Teachers in Technical Institutes to forward to you the following resolutions which have been passed by the Council respecting the examinations held by the Board of Education in "Building Construction":—

"1. That in view of the extensive character of the syllabus of 'Building Construction,' the questions set in examination papers in this subject should be fairly proportioned to the various sections of the syllabus.

2. With regard to the compulsory tracing which is set in Stages 1 and 2 and 3, it is urged that, whilst tracing in Stages 1 and 2 is necessary and valuable, the tracing in Stage 3 might reasonably be omitted, and a question of greater value substituted.

3. That in the Honours Stage where questions are set in highly specialised buildings, as hospitals, buildings for educational purposes, barracks, asylums, etc., one month's notice should be given as to the type of building to be set, in order that the students may have an opportunity of studying the various regulations and requirements as set forth in various Blue Books, Building Acts, and By-laws."

Our Council are of opinion that the adoption of the above recommendations with reference to future examinations in "Building Construction" will greatly enhance the value of these examinations, and the Council earnestly desire the Board of Education to give the recommendations careful consideration.

J. WILSON,
Hon. Secretary Association of Teachers in Technical Institutes.

HOVE LIBRARY COMPETITION.

SIR,—I read with a certain amount of interest, mixed with wonder, the criticism in last week's *Builder* on the Hove Library Competition. The notice contained a statement that "the award could be considered sound, and that the necessary air space in the rear of the building had been duly provided." This, I am sorry to state, is quite untrue. Allow me to give a short history of the competition. A year ago the Borough of Hove advertised for designs, but would not fix on or promise an assessor, therefore the Chairman of the Competitions Committee of the Royal Institute of British Architects advised all members to have nothing to do with it. However, nearly a hundred designs were submitted, and, to everyone's surprise, Mr. J. Belcher, President of the Royal Institute of British Architects, was chosen and accepted as assessor, who, after a careful examination of the designs, stated that no design was worthy of an award, and that the best had violated by-law 62. After a considerable delay ten designs were chosen, and competitors asked to reconsider their schemes. A few weeks ago the awards were announced, but until I saw the successful design I never for a moment doubted, but the moment I saw the design I was amazed, stupefied, and confounded. The successful design has broken the by-laws, and, therefore, easily got a plan which was no secret, and but for by-law 62 (which states that if a building exceed 35 ft. in height the space at rear must be 25 ft. across the whole width of the site; in the successful design the nearest point is 12 ft.) at least one other design would have had a similar plan. Can you or any of your readers give me light?

JAS. B. FULTON.

*** Our reviewer writes:—"I scarcely think Mr. Fulton has a grievance. I took careful notes of all the plans, and I still think the winning design has a solution on a fair and legitimate interpretation of the by-laws, and that the award as regards first place is sound. This matter of air space is the more evident to those who may have had the advantage of studying the sections and plans together, as with the pyramidal form of rear buildings in the winning design there could be no possible question of 'air space.' This would be most effectively demonstrated in a model.

I tried to get hold of a copy of the conditions of the competition when at Hove, but—as noted in the review—without success. So I cannot, of course, say what emphasis was put on following the *letter* of the by-laws."

THE INTERNATIONAL BUILDING TRADES EXHIBITION.

SIR,—My attention has just been called to a paragraph in your issue of the 25th ult., headed "International Building Trades Exhibition," and stating that the Crystal Palace Company have under consideration the opening of an exhibition with that title next spring.

It so happens that I am opening next spring—in April, to wit—the International Building Trades Exhibition of 1907 at Olympia, and as this will be the seventh of the biennial series I have been conducting for the past twelve years under that title (at the Royal Agricultural Hall, Islington), I must protest against a use of the said title in connexion with other persons that is obviously likely to lead the public to think that the Crystal Palace exhibition is mine.

I have no wish to interfere with the projects of any persons who may believe the Crystal Palace to be a suitable centre for an exhibition connected with the building trades, but I cannot allow them to use a title which I have made my own.

H. GREVILLE MONTGOMERY.

*** Mr. Montgomery should address his remonstrance to the Crystal Palace Company rather than to us. If he can induce them to use another title, of course we should report it accordingly. We cannot select their title for them.—ED.

The Student's Column.

ROOFS: STRUCTURALLY CONSIDERED.—II.

IN this article we continue the consideration of materials employed for the outer covering in roof construction.

7. *Zinc.*

The statement has been made that zinc is a valuable material for covering roofs in consequence of its lightness, strength, and durability.

This view cannot be characterised as incorrect, but it should not be accepted without qualification.

For instance, taking account of specific gravity and tensile strength, zinc is stronger weight for weight than lead, tile, slate, and glass, but weaker than wrought-iron, mild steel, and copper. Comparing zinc with wrought-iron, its specific gravity is about 7. as against about 7·7, and its tensile strength about 7 tons per square inch, as against about 21 tons per square inch.

Again, it cannot be said that zinc is more durable than lead, copper, tile, slate, and glass, although it is not liable to breakage like the three last-mentioned materials, and is less affected by atmospheric action than iron.

Still, zinc, in the form of plain and corrugated sheets, is an excellent and convenient roofing material, whose use has been gradually extending for many years past in this country.

When zinc is exposed to the atmosphere a thin coating of oxide (ZnO) or basic carbonic ($8ZnO, 3CO_2$) is formed, which protects the metal beneath from further change, and does not scale off like the zinc oxide formed under similar conditions on galvanised iron. Consequently, zinc employed in roofing need not be protected by paint.

Zinc of inferior quality is very susceptible to deterioration by the products of combustion of coal, coke, and wood, and zinc generally is prejudicially affected by soot.

Zinc should never be laid in direct contact with iron or copper, as in the presence of moisture electrical action will be induced leading to the rapid destruction of the metal. Contact with lead is also undesirable. Zinc suffers when in contact with lime or water containing calcium compounds, and is liable to deterioration if laid on oak boarding or on other timber that has not been thoroughly dried.

As the coefficient of expansion for zinc is relatively high, being 0·0000163, as compared with 0·0000065 for wrought-iron, all joints should be formed so that the metal shall be free to expand and contract with temperature variations.

No joints should be soldered, and the use of nails ought to be avoided entirely, except for fixing clips and other fastenings which do not interfere with the free movement of the sheets.

The melting-point of zinc is 736 deg. Fahr.

In view of the fact that zinc sheets are rolled to two different standards—the old Belgian zinc gauge and the new gauge of the Vieille Montagne Company—it is always desirable that the weight of metal per square foot should be stated in specifications.

The difference between the most generally-

used sizes of the two gauges is shown in the subjoined table :—

TABLE II.—COMPARISON OF ZINC GAUGES.

Old Belgian (O.B.G.).			Vieille Montagne (V.M.G.).		
No.	S.W.G. (1)	Oz. per sq. ft. (2).	No.	S.W.G. (1)	Oz. per sq. ft. (2).
10	24	13½	10	25	11½
11	23	15½	11	24	13½
12	22	18	12	23	15
13	21	19½	13	22	17
14	20	21½	14	21	18½
15	19	24	15	20	21½
16	18	26	16	19	24½

(1) Approximate. (2) Subject to slight variation.

For temporary roofs, No. 13 O.B.G. or No. 14 V.M.G. may be used, but for permanent work Nos. 14 and 15 O.B.G., or Nos. 15 and 16 V.M.G. should be adopted.

Corrugated zinc sheets are usually made of the dimensions stated in Table III., and are chiefly used in covering curved roofs. When curved and lapped, 3-ft. sheets cover a width of 2 ft. 6 in. each.

TABLE III.—CORRUGATED ZINC SHEETS.
Width = 3 ft. Length = 7 ft. 8 ft., and 10 ft.

V.M.G.	Approximate S.W.G.	Thickness in inches.
No.		
10	25	0·0180
11	24	0·0217
12	23	0·0254
13	22	0·0290
14	21	0·0326
15	20	0·0364
16	19	0·0410

Flat zinc sheets are usually applied to roofing in accordance with the roll-cap system on boarding. If iron nails are used for securing the boards, their heads should be punched well into the timber, and the holes filled with putty.

Wood rolls of square or rounded section are laid upon the boarding at intervals of about 2 ft. 10½ in. apart, centre to centre, in the direction of the roof slope, and held in place by zinc clips passing under the rolls, spaced 3 ft. apart, in the length of the latter, and secured to the boarding by zinc nails.

The sheets of zinc are laid between the rolls, their sides being turned up against the rolls and tucked into the flaps of the clips. The joints are completed by zinc roll-caps fastened by holding down clips, and finished with stop ends.

Zinc-covered flats should have a fall of not less than 1 in 80, and inclined roofs a slope of not less than 1 in 15.

When the slope is less than 1 in 8 the timber boarding of a roof which is wider than about 10 ft. should be laid in steps from 7 ft. 6 in. to 9 ft. 6 in. wide, parallel to the ridge of the roof, to provide for the drip formed at the lower end of each sheet of zinc. The height of the steps must be sufficient to permit the upper end of each roll to pass beneath the projecting lower end of the sheet above. For plain roll-caps a drip of about 2½ in. is sufficient, but roll-caps drawn on wood require a drip of about 3½ in. The lower end of each roll-cap is finished with a solid folded saddle-piece and stop end.

When the slope exceeds 1 in 8, drips are not necessary, and the ends of the zinc sheets are connected by double folded or *welted* joints, permitting expansion and contraction of the metal, but effectively preventing the penetration of water between the sheets.

Zinc sheets corrugated on the "Italian" system have flutes 15 in. apart, centre to centre, the intervening parts being flat. Such sheets can be laid directly upon rafters of suitable spacing, and fixed by holding down clips, the flutes at each side of the sheets being overlapped as in the case of corrugated iron sheets.

Plain and corrugated sheets, roll-caps, ridging, gutters, flashings, nails, and all the requisite accessories for completing zinc roof coverings are obtainable in great variety from the leading firms of metal-workers.

8. *Lead.*

At ordinary temperatures lead is unaffected by dry air, and when exposed to moist air a film of oxide is formed upon the surface, protecting the metal from further chemical action.

Lead rapidly oxidises under the combined action of air and water, forming the hydrated oxide (PbH_2O_2), which, being dissolved by the water, leaves a clean surface of lead liable to fresh attacks.

A limited quantitiy of carbon dioxide in the water tends to prevent the corrosion of lead by depositing on the surface a film of insoluble plumbic carbonate ($PbCO_3$). On the other hand, as plumbic carbonate is soluble in water highly charged with carbon dioxide, an excess of that gas may increase corrosive action.

Corrosion is hindered by the presence of sulphates, carbonates, and vegetable matter in water. It is encouraged by calcic sulphate in the presence of moisture, and for this reason metallic lead should never be used in contact with plaster of Paris.

At ordinary temperatures sulphuric and hydrochloric acid have no action upon lead. Acetic acid is a powerful solvent, and in the presence of carbon dioxide results in the production of the basic carbonate ($2PbCO_3$, PbH_2O_2), known as *white lead*. Hence lead should never be laid upon timber, such as green oak, which contains acetic acid.

Lead should not be laid in direct contact with other metals, or, in the presence of moisture, destructive electrical action will be induced.

The ductility of lead conduces very largely to its usefulness, but, owing to the fact that its tensile strength is not more than 1·5 tons per square inch, lead sheeting must always be laid upon close boarding.

As the coefficient of expansion for lead is relatively high, being 0·000015 as compared with 0·0000065 in the case of iron, the metal should not be laid in sheets of greater length than 12 ft., and it must not be fixed so as to interfere with expansion and contraction. The use of solder should always be avoided when possible, and when nails are necessary they should be of copper. The melting-point of lead is 612 deg Fahr.

Lead, as used in roof construction, is rolled in sheets usually measuring from 6 ft. to 7 ft. 6 in. wide, from 25 ft. to 35 ft. long, and from about $\frac{1}{80}$th to $\frac{1}{7}$th of an inch thick.

Sheet lead is invariably sold by weight, the number of pounds per square foot, instead of the thickness, being used as the standard of comparison.

Table IV. gives the thickness of sheet lead from 1 lb. to 12 lb. per square foot, and, for convenience in comparing the thicknesses with those of iron, zinc, and copper sheets, the approximate equivalents are given in standard wire gauge.

TABLE IV.—THE THICKNESS OF SHEET LEAD.

Weight per sq. ft. in lb.	Thickness in in.	Approximate S.W.G.
1	0·017	26—27
2	0·034	20—21
3	0·051	17—18
4	0·068	15—16
5	0·085	13—14
6	0·101	12—13
7	0·118	10—11
8	0·135	9—10
9	0·152	8— 9
10	0·169	7— 8
11	0·186	6— 7
12	0·203	5— 6

The most suitable weights for lead employed in roofing work are as follows :—

Roof covering and main gutters ... 7 lb.
Ridges, hips, and small gutters ... 6 lb.
Flashings ... ... 5 lb.

Lead-covered flats should have a fall of not less than 1 in 80, and when the width exceeds 12 ft. the boarding should be stepped suitably for the formation of drips 2 in. deep.

Lead sheets are laid in a manner very similar to that adopted in the case of zinc. Wood rolls—varying in section from 1¾ in. by 1½ in. to 2½ in. by 2 in.—are nailed to the boarding at intervals of about 3 ft. apart centre to centre; one sheet of lead is then laid and dressed up to and two-thirds of the way over the roll at one side; the next sheet is brought up to the same roll and lapped completely over it and the overlap of the first sheet. By hammering down the lead with wooden mallets no nails are required. The end joints of the sheets at the drips are similar to those made in zinc.

Joints should have a lap of at least 4 in. in ridges, hips, and flashings, and not less than 5 in. in roof slopes and valleys.

9. *Copper.*

At ordinary temperatures copper is unaffected by dry air, and in moist air or in contact with water it becomes coated with a film of hydrated dibasic carbonate, popularly known as verdigris, with the approximate composition: $CuCO_3$, CuH_2O_2.

Copper is readily soluble in ammonia, but is scarcely affected by the fixed alkalis. It is far more durable than iron, zinc, or lead, and for this reason is frequently more economical in the long run than the less expensive metals.

Copper is characterised by great ductility, and high tenacity as compared with practically all metals save iron and steel, its tensile strength being 15 tons per square inch.

The coefficient of expansion of copper is 0·0000088. Consequently, it expands and contracts much less than zinc and lead. The melting-point of copper is 1996 deg. Fahr.

The physical properties mentioned above point clearly to copper as the best material (structurally) for roof covering. Although not so strong as iron and steel, it is far more durable than either of those metals. Copper is superior to zinc and lead in respect of its superior durability, small expansion, and contraction, high melting-point, and high tenacity. The chief objection to copper is first cost, but this is often counterbalanced, not only by the almost imperishable nature of the metal, but also by the smaller weight required for a given duty.

If the thickness of roofing sheets could be regulated solely by the tensile strength of the metal, copper would be quite as inexpensive as zinc, and much less expensive than lead. But for structural reasons it is not desirable to use copper of less weight than 12 oz. per square foot, and as the price per ton is considerably increased for sheets weighing less than 16 oz. per square foot, very little would be gained by adopting thinner gauges.

Consequently the usual practice is to employ 16 oz. copper (about 24 S.W.G.) for roofing purposes.

Table V. gives the weight and strength of copper, zinc, and lead of the gauges generally adopted in practice, and shows that copper compares very favourably as regards weight and strength with either of the other metals in question.

TABLE V.—WEIGHT AND TENSILE STRENGTH OF COPPER, ZINC, AND LEAD SHEETS 1 FT. WIDE, AND OF THE THICKNESS USUALLY EMPLOYED FOR ROOF COVERING.

——	Copper.	Zinc.	Lead.
S.W.G. (approx.)	No. 24.	No. 19.	Nos. 10—11.
Weight	1 lb.	1·56	7 lb.
Thickness	0·022 in.	0·041 in.	0·118 in.
Tensile Strength	8,870 lb.	3,306 lb.	4,757 lb.

Copper roofing sheets should be laid with wood rolls on the boarding at intervals of about 2 ft. 4 in. apart, the roll-caps being welted on to the sheets to prevent any tendency towards opening at the joints. No drips are necessary, as welted joints at the ends of the sheets are quite satisfactory.

COURT OF COMMON COUNCIL.

A MEETING of the City Corporation was held at the Guildhall on Thursday last week, the Lord Mayor presiding.

Application from the Institute of Builders.—An application from the President of this Institute for a set of medals struck by order of the Corporation was referred to the Library Committee.

Loan of Pictures.—To the same Committee was also referred the application of the Burnley Town Council for the loan of pictures belonging to the Corporation for their summer exhibition of 1907.

The City Arms.—The Organising Committee of the Franco-British Exhibition applied for permission to use the arms of the City of London on letter paper and literature issued by them. In the course of a discussion which ensued it was pointed out that the application was merely an act of courtesy, as the City arms could be used by anyone without permission. The matter was referred to the Library Committee.

Alterations at the Central General Market.—The Central Markets Committee recommended the acceptance of the tender of Messrs. Johnson & Co., Ltd., of Wandsworth, at 596*l.*, for works of

alteration in connexion with premises in the Central General Market formerly used by the Market Constables. This was referred to the Coal and Corn and Finance Committee.

Slaughter-houses.—The Cattle Markets Committee, in a report, recommended the abolition of private slaughter-houses at the Metropolitan Cattle Market, and the construction of public slaughter-houses thereat, divided into separate chambers for cattle and sheep, and with a general chamber for pigs, at an estimated cost of not exceeding 40,000*l.* It was resolved that the report be printed and its consideration adjourned, and that it should also be referred to the Coal and Corn and Finance Committee.

Improvement of King Edward-street.—The Improvements and Finance Committee were authorised to purchase from the authorities of Christ Hospital, at a cost of 5,000*l.*, a strip of land necessary for the widening of this thoroughfare.

OPENING OF BRUCE HOUSE, KEMBLE-STREET.

BRUCE HOUSE, which was formally opened last week, is the third lodging-house which the London County Council has provided, and has been built in compliance with the scheme sanctioned by the Home Office for the re-housing of persons of the working class displaced in connexion with the Holborn to Strand Improvement. The site has a frontage of about 220 ft. to Kemble-street, 108 ft. to Drury-lane, and 139 ft. to Kean-street. The plan of the building is E-shaped above the ground-floor, so arranged as to provide adequate light and air to the cubicles. It is six stories in height. The elevations, which look exceedingly well in a simple fashion, are of red-brick facings, relieved with glazed and Luton bricks, stonework and rough cast, and the roofs are covered with green slates. The ground floor (lodger's section) comprises dining-room (including hot chamber and lodgers' crockery store), smoking-room, reading-room, writing-room, locker-room, parcels-room, and water-closets, and urinals for the use of lodgers. The administrative section comprises office, superintendent's quarters, clerk's bedroom, female staff sitting-room and bedrooms, porter's day-room, and shop. The basement (lodgers' portion) comprises lavatory, feet-washing room, baths, dressing-rooms, lodgers' wash-house, boot-brushing room, and barber's and bootmaker's shops. The administrative portion comprises establishment scullery, kitchen, bread and milk store, larder, crockery-store, shop-store, general store, bed-maker's day-room, soiled linen-room, clean linen-room, establishment laundry (including drying-chambers, one being set apart for mattresses), ironing-room, heating chambers and coal stores, and a disinfecting chamber. The upper stories, comprising 709 cubicles (with sanitary appliances on each floor), afford accommodation for 699 lodgers and ten porters. On the ground floor there is a room facing Kean-street, which it is proposed to let for commercial purposes. In the dining-room fixed teak tables and seats are provided to accommodate 360 men at one time. Near the middle of the room is an open chamber for a large hot plate, at which lodgers can, if they desire, cook their own food. Sinks, with hot and cold water, are provided in two recesses off this chamber, where food can be prepared for cooking. A cylinder is fixed at each end of the hot plate chamber with a constant supply of hot water for making tea, etc., and there are also two large cooking-ranges. The lodgers' crockery-store is placed on the north-east side of the dining-room, and any lodger electing to cook and prepare his food will find, arranged on shelves, both cooking utensils and crockery. A lift, communicating with the establishment scullery, is fitted in the wall to complete the service arrangements. The smoking-room is on the main frontage, with fixed teak tables and seats, and heated by two open fireplaces, with special provision for the discharge of warm air. The reading-room is approached from the two main corridors, and a special writing-room is provided, approached from the reading-room. The water-closets and urinals are approached through a disconnecting lobby at the end of the main corridor. In the basement is a lavatory-room fitted with glazed fireclay basins, with hot and cold water supply to each. The bath-rooms are in close proximity to the lavatory, and contain five glazed fireclay slipper baths and one shower-bath with hot and cold supply to each. A waiting place is provided in connexion with the baths. Two rooms are placed near the lavatory for the use of lodgers desiring to change their clothes during the hours in which the cubicles are closed. The lodgers' wash-house is situated at the north-east end of the building, and is fitted with ten glazed fireclay washing troughs, with hot and cold water, for the use of lodgers desiring to wash their own garments. There is also a drying chamber, fitted with four drying horses, heated by steam coils. Shops are provided for a barber and a bootmaker, for the convenience of the lodgers. A room adjoining the bootmaker's shop is fitted with a bench, and is allocated to the lodgers for the purpose of boot-brushing. Each cubicle floor is divided into sections by division walls, which admit of the isolation and disinfection of sections in the event of contagious disease, and would also check the spread of fire. Each lodger has an independent cubicle having a minimum width of 4 ft. 10½ in., and an area of 36 superficial feet, and lighted by a separate window. The height of the stories from floor to ceiling is 9 ft., with the exception of the top floor, which is 8 ft. 9 in. The partitions between the cubicles are 7 ft. 6 in. in height, that portion adjoining the corridor is 6 ft. 6 in. in height, thus ensuring ample ventilation. The cubicle partitions are framed wood with panels which can be taken out and replaced, if necessary, without disturbing the framing. Each cubicle contains an iron bedstead with spring mattress, the whole of which can be folded back against the partition for the purpose of readily sweeping and cleansing the floor. There are two principal staircases leading to the cubicles, and, in addition, one emergency staircase. These are so arranged as to make it practically impossible for any part of the cubicle corridors to be cut off from one or more of the staircases in the event of fire. Iron gates, fitted with panic bolts are provided to the staircases to prevent lodgers having access to the cubicles during prohibited hours. Teak doors have been provided on the landings of the staircases, in order to check the spread of fire from one floor to another, and each staircase is fitted with a fire hydrant with hose pipes at the level of each cubicle floor. There are four water-closets on each floor on the staircase landings for night use, with the exception of the top floor, where two water-closets are provided. Taps for drinking water are also provided at these landings. The establishment scullery, which is situated in the basement, is fitted with teak and glazed fireclay sinks, and is connected with the lodgers' crockery store on the ground floor by a lift. The kitchen is spacious and is lighted from two sides. It is fitted with a large cooking-range, a gas cooking-range, potato-steamer, shelves, cupboards, etc. In close proximity to the kitchen is the larder, bread and milk store, with stores for crockery, shop and general purposes. The heating chamber is fitted with two Cornish steam boilers for the supply of hot water and steam to the lodgers' and administrative sections. The laundry, which is used for establishment purposes, includes a wash-house, fitted with two steam washing-machines, hydro-extractor, boiling-copper and soap and soda boilers, a drying chamber fitted with eight drying horses, a blanket drying chamber, an ironing-room, and clean linen-room, the last fitted with slatted shelves for the storage of clean linen, and provided with a lift to each cubicle floor. A soiled linen-room with a shoot connected to each cubicle floor is provided for the reception of soiled linen previous to its despatch to the laundry. The whole work has been carried out under the superintendence of the Council's architect, Mr. W. E. Riley.

Obituary.

MR. MAY.—The death, on July 7, at Hampstead, is announced of Mr. Francis J. C. May, in his sixty-eighth year, who, until his retirement four months ago, was Engineer and Surveyor to the Corporation of Brighton. He was appointed to that post in 1889, having previously been Surveyor to the Borough of Maidstone. Mr. May prepared the plans and designs for, at Brighton, the new Municipal School of Science and Technology in Richmond-terrace on the eastern side of the Level, with provision for future extensions (1897); the Borough Sanatorium, whereof the first portion, consisting of an administrative block, ward pavilion, isolation block, disinfecting-station, etc., was opened in November, 1898, having been built by Messrs. Peters & Son, of Horsham, who tendered for 19,775*l.*; the new municipal buildings on the Pavilion estate, including a public library, museum, and art gallery, with separate entrances from Church-street, a new picture-gallery, and a carriage-portal in place of the old wooden pent-house in front of the Dome in the Pavilion grounds, the contract amounting to nearly 38,000*l.* (1900-1); alterations and enlargement of the Fruit and Vegetable Market; the new telephone-room at the Royal Pavilion for the Corporation; and two pavilions, with a mortuary, at the Borough Sanatorium in Bear-road, with other works connected therewith (1902). Mr. May also built the swimming-bath, made plans for enlarging and improving the Town Hall, and carried out schemes for sewerage, protection of the sea-front, and similar undertakings. Mr. May was a Past-President of the Incorporated Association of Municipal and County Engineers, a member of the Institution of Civil Engineers, and a Fellow of the Surveyors' Institution.

MR. ADYE.—Mr. Charles Septimus Adye, of the County Offices, Trowbridge, County Surveyor for Wiltshire, died, aged sixty-five years, on July 7, at Westbury House, Bradford-on-Avon. Of his more recent work we may mention the new female ward at the Wilts County Pauper and Lunatic Asylum, Devizes, for which he made the plans four years ago.

MR. DAY.—Mr. William Day, who died lately, aged eighty-three years, was a member of the long-established firm of Messrs. Day & Son, publishers and lithographic printers, of Gate-street, Lincoln's Inn-fields. Mr. Day entered upon the management of his father's business in 1845, and printed the plans and drawings of many of our principal railway engineers. He also produced several art-plates and the illustrations for Owen Jones's "Grammar of Ornament"; some of Digby Wyatt's books; W. Simpson's "Crimea"; and "The Holy Land," by David Roberts, R.A., whose sketches Louis Haghe reproduced upon stone.

General Building News.

CHURCH, GRANTHAM.—A new church is being erected at New Somerby, which is within the borough of Grantham, and the foundation-stone has just been laid. The whole scheme will entail an expenditure of between 5,000*l.* and 6,000*l.*, but it was decided to erect a nave, with north and south aisles, and a temporary east end at a cost of 3,000*l.* at first. The site is on the eastern side of the Harrowby-road, and adjoining the Grantham Cemetery, and the church will be perpendicular in style, built in red brick, with Ancaster stone dressings and a green slated roof. The length, including the chancel, when completed will be 113 ft. by 63 ft. wide, and is designed to seat 544 persons, the seats being arranged in two blocks in the nave, and one in each aisle. The feature of the edifice will be the large western window facing the street, with a bell turret at the south-western angle. There will be porches at the north-west and south-west angles, giving access to the nave and aisles, whilst when erected the chancel will have accommodation for a choir of about 30. When complete there will be in the north side choir and clergy vestries, with heating chamber beneath, and organ loft above. The font is to be placed under the western window, and raised by two steps, whilst the pulpit will be on the north-east of the nave, close to the choir-stalls. There are to be two steps into the chancel, and the altar-table will be raised five steps above the nave. The east window will be in keeping with the remainder of the building, and will be raised high up, so as to give an opportunity in the future for a reredos. The ventilating flèche will eventually be erected on the roof, at the junction of the nave and chancel. The nave roof will be supported by a stone arcade of four bays on each side, carrying a boarded panelled roof, 26 ft. 6 in. high, at the apex. The height of the aisle roofs will be 11 ft. 6 in., rising to 20 ft. The architect is Mr. B. H. Tarrant, of Upper Tooting, London, and the contractor is Mr. A. S. Cooke, of Stroud, Gloucestershire.

CHURCH, RIEVAULX, YORKSHIRE.—The Earl of Eversham recently laid the foundation-stone of St. Mary's Church, Rievaulx, a new edifice which is to be raised over a portion of the ruins of Rievaulx Abbey. The work of designing the church has been primarily placed in the hands of Mr. Temple Moore. The estimated cost of the scheme is about 1,700*l.*, and the church, when completed, will provide accommodation for 80 persons. Mr. Brotton, of Bilsdale, has been entrusted with the building contract.

CHURCH, TOOTING.—The Bishop of Southwark consecrated on the 7th inst. a church, built at a cost of 50,000*l.*, at Tooting Graveney, in memory of the late Lord Charles William Brudenell-Bruce. The building was designed by Mr. Temple Moore, and is built of brick, with stone facings, and is roofed with red tiles. The church is 180 ft. long, with a tower nearly 100 ft. high, while accommodation is provided for 1,024 worshippers. Besides the church, the memorial scheme includes a parish hall, capable of holding 600 or 700 people, a vicarage, and three houses, which have yet to be built.

NEW CHURCH, LEICESTER.—The church of All Souls, Leicester, was opened recently by the Bishop of Peterborough. The church, designed by Mr. G. F. Bodley, R.A., will accommodate about 700 worshippers, and has cost over 10,000*l.*

ST. PAUL'S CHURCH, LEYTON.—The first permanent part of this church is now being erected for the accommodation of 503 persons. There will be a temporary chancel of wood and iron with slate roof, and a temporary porch at the west end. The portion of permanent church to be erected at present will consist of the four easternmost bays of nave, with chancel arch and north and south aisles thereto and the westernmost halves of north and south transepts. These two latter will be built to a certain height only at present, and on completion will accommodate the organ and choir vestry in upper parts. The south transept will at present serve as a vestry, and will have lavatory accommodation. The flues for entire heating system will be constructed at present, and it will only require a second apparatus to serve the completed church

when built. The present temporary work will, so far as possible, be utilised in building the completion of the church. This part of the church, together with furniture, is estimated to cost 5,000*l*. The total amount required (excluding tower) is 9,000*l*. The architect is Mr. G. E. S. Streatfield, and the builder Mr. Saint, of Cambridge.

CONGREGATIONAL CHURCH, STRATFORD.—The foundation stones have been laid of a new Wycliffe Congregational Church in Cranbrook-road. The church will seat 815 people, including 195 in a gallery. A lecture hall below the church will seat over 600, and there will be a church parlour, ministers' and deacons' vestries, and other offices. The plans of Messrs. Smee & Houchin were selected in competition, the contractor was Mr. J. Maddison, of Canning Town.

ROMAN CATHOLIC CHURCH, TYNE DOCK.—A new Roman Catholic church dedicated to SS. Peter and Paul, was opened recently at Tyne Dock. It is constructed of pressed Accrington brick, with facings of Rothbury stone, and embraces a nave and sanctuary 92 ft. long by 21 ft. wide, finished with an apsedal end, and north and south aisles 11 ft. 6 in. wide. The benches and pews are of oak, and there is accommodation for 500 adults. The church has been designed by Messrs. Brodrick, Lowther, & Walker, architects, of Hull, and the contractor for the work was Mr. James Young, Tyne Dock.

NEW CHURCH, BRENTFORD.—A new church is being erected in St. Paul's Parish, Brentford, at a cost of 8,000*l*. The architect is Mr. G. F. Bodley, R.A., the builders being Messrs. Dorey & Co., Brentford.

CONGREGATIONAL CHURCH, SOUTH NORWOOD.—On the 4th inst. the foundation stones of the new South Norwood Congregational Church, situated on a corner site in Enmore-road, were laid. The new church has been designed by Messrs. George Baines & Son. The contract price for the present portion, embracing church and vestries complete, with the tower up to the belfry stage, is 4,090*l*. The builders are Messrs. Walter Lawrence & Son, of Waltham Cross.

CHURCH, BRYANT'S-HILL, BRISTOL.—The memorial-stones have just been laid of the new John Wesley Memorial Church at Bryant's Hill. The building has been designed by Mr. W. H. Dinsley, of Chorley, a conspicuous feature of it being a clock-tower, terminating in a spire. The dimensions are 70 ft. by 40 ft. The transepts will be 57½ ft. wide, and the orchestra 25 ft. The exterior will be of Pennant stone, with Bath stone dressing, and the interior woodwork of polished pine. The buildings will entail a cost of about 4,500*l*., and it will accommodate 750 persons.

PRESBYTERIAN CHURCH, GOSFORTH.—The foundation-stones of the new Presbyterian Church at the corner of West-avenue and High-street, Gosforth, were laid recently. Messrs. Badenoch & Bruce, of Newcastle, are the architects. The building will cost 5,000*l*.; but in the meantime the erection of the tower and transepts is not to be proceeded with. The present cost is 3,500*l*. Seating will be provided for nearly 500 worshippers, and the building will be lighted by electricity.

ROMAN CATHOLIC CHURCH, SEAHAM HARBOUR.—A start has been made with the ground work of the new Roman Catholic Church at Seaham Harbour, plans having been passed by the Seaham Council. The church will be built close to the new presbytery, adjoining which will be the sacristy. The dimensions of the new building will be as follows:—Length, 100 ft.; breadth, 57 ft.; height, 46 ft.; and there will be accommodation for 500 persons. The building will be in the Romanesque style. The cost is estimated at about 5,000*l*. The plans have been drawn by Mr. T. Axtell, of Ryhope.

U. F. CHURCH, COLDSTREAM.—On the 5th inst. the foundation-stone was laid of the New West U. F. Church at Coldstream. Mr. George Reavell, jun., of Alnwick, prepared the plans. The building is in Doddington stone, and will be covered with Buttermere slates. The hall was built by Messrs. W. Smith & Sons, masons, slaters and plasterers; Messrs. J. & A. Gray, joiners; Mrs. A. Ford, plumber; Mr. A. Hogarth, painter; all of Coldstream, and the church is in the hands of Mr. A. Douglas, Amble, mason; Messrs. A. Inglis & Sons, Hawick, joiners; Mrs. A. Ford, Coldstream, plumber; Messrs. W. Smith & Sons, Coldstream, slaters and plasterers; Mr. A. Hogarth, Coldstream, painter. The south window is to be filled with stained glass by Messrs. Percy Bacon & Brothers, of London.

WESLEYAN CHURCH, ARMLEY.—A new Wesleyan Church is being built at Armley. The building, which is to have a tower and spire at one angle, is to cost about 6,000*l*. It will be faced with stone, and will accommodate 700 people. Messrs. W. J. Morley & Sons, of Bradford and London, are the architects.

U.F. CHURCH, NEWBURGH.—The new U.F. Church was opened on the 27th ult. The church contains sitting accommodation for 350, arranged in nave and transepts. There is a shallow recess at the end of the nave, in which the pulpit is set. A chancel arch of stone with pillars and carved capitals divides this recess from the nave. The pulpit is of carved oak. A vestibule extends across the whole of the south end, and its walls are divided into panels with wood mouldings. A recessed three-light tracery window over the vestibule lights the south end of the nave, while the transepts are also lighted by tracery windows. The woodwork is of pitch-pine, stained and wax polished. The other accommodation provided consists of a hall to seat 100, vestry, lavatory, and heating-chamber. The hall ceiling is treated with plaster panels. The heating is on the low-pressure hot-water system. The walls of the church are tinted with a red colour, and the coves and ceiling are cream colour. The walls are of local whinstone, with white freestone dressings, and the roofs are covered with green slates. The work has been carried out from plans prepared by Messrs. Thomas & Wilkie, architects, Dundee, by the following contractors:—A. &. T. Craig, masons; D. S. & J. Anderson, joiners; David Brown, plumber; Adam Beveridge, plasterer; John Storrier, slater; R. C. Haines, glazier and painter; Davidson & Sons, heating engineers; grates and railings, A. M'Call & Son. The stone carving was done by Mr. Alexander Neilson, and the clerk of works was Mr. David Galloway.

CHURCH RESTORATION, ROTHESAY.—During the past eight months the Parish Church of Rothesay has been undergoing a complete overhaul and having considerable additions made to its main structure. The interior has been remodelled under the direction of Mr. Duncan Dewar, architect, Rothesay, at a cost of 2,200*l*. Complete vestries and lavatories have been added, but the tower has not been completed meantime.

CONGREGATIONAL CHURCH, BITTERNE PARK, SOUTHAMPTON.—The new Congregational Church at Bitterne Park was recently opened. The architect was Mr. J. H. Blizard, who was assisted by his managing assistant, Mr. Knox, in all the detail work connected with the design, the builder being Mr. Jupe. The seating arrangements were carried out by Messrs. A. E. Jukes & Sons (Freemantle), and Messrs. Lankester & Sons were responsible for the lighting and heating, while Messrs. Shepherd & Hedger did most of the furnishing.

BAPTIST CHAPEL, DROITWICH.—A new Baptist chapel and schoolroom have been erected at Droitwich. The walls generally are of thin bricks, with buttresses to the sides and stone dressings, and stone-headed windows of the three lights are placed between them in the side walls. The interior of the church is fitted with pine seats, the walls are lined with Oregon pine dadoes and stucco above; the chancel arch is of stone, and the roof is slated. The school-room is 45 ft. long and 26 ft. wide, and has an open timber roof, coloured walls and pine dado. The builder was Mr. Henry Smith, of Kidderminster, and the architect Mr. Francis B. Andrews.

ROMAN CATHOLIC CHAPEL, LOWER BULLINGHAM.—The new chapel at Lower Bullingham, near Hereford, erected for the use of the Community of the Sisters of Charity of St. Vincent de Paul, was consecrated by Dr. Hedley, Bishop of Newport, a short time ago. The structure has been built by Messrs. William Bowers & Co., Hereford, to the designs of Mr. Ware, Exeter, at a cost of between 4,000*l*. and 5,000*l*. Among the decorations is a reredos of Canne stone, the work of Messrs. Bolton & Sons, Cheltenham. The aisles and other parts are paved with encaustic tiles from the works of Messrs. Godwin & Son, Lugwardine, and the remainder of the flooring is composed of wooden blocks.

PRIMITIVE METHODIST CHAPEL, OVINGTON.—A new Methodist chapel is being erected at Ovington. The builders are Messrs. A. E. Harvey, of Watton, from plans prepared by Mr. H. Winkworth, architect, of Ipswich. The chapel will have a seating accommodation of about 100, and cost about 200*l*.

BAPTIST SUNDAY SCHOOLS, IPSWICH.—New Sunday schools have been opened in connexion with the Bethesda Baptist Chapel in Fonnereau-road, Ipswich. The new buildings were designed by Mr. Frederick G. Faunch, the contractor being Mr. G. A. Kenney.

COUNCIL SCHOOLS, VENTNOR.—Mr. Godfrey Baring, M.P., recently opened the new Council schools which have been erected at Ventnor. The schools have been built by Mr. Albert Sims, of Ventnor, to the plans of Mr. Cocks, of Ryde, the County Surveyor, at a cost of 3,900*l*. The exterior of the building is of local freestone, with Bath stone dressings. The roof is of Welsh green slates. Inside the walls are panelled with white glazed bricks, and the floors are of wood blocks. The rooms are fitted with Stone's patent swivel partitions, and the building is heated throughout with water and radiators, with Sharland's patent ventilators.

SOUTH WALES UNIVERSITY COLLEGE.—Eighteen tenders were received for the erection of the main building and library in Cathays Park, the first portion of the complete scheme. The Council have adopted a recommendation of the Building Committee to accept the tender of Messrs. E. Turner & Sons, of Cardiff, at 68,985*l*., for the main building, and 18,862*l*. for the library. Messrs. W. King & Son, of London, tendered at 85,527*l*. for the two buildings. Mr. W. D. Caröe's designs, with elevations and plans, are illustrated in our number of May 7, 1904.

CHURCH TOWER, HIGH CROSS, HERTFORDSHIRE.—A tower is being added to the High Cross Parish Church, Mr. Ford Whitcombe is the architect, and Messrs. Ekins & Co., of Hertford, are the builders. It will be 86 ft. high, and the foundation goes down to a depth of 9 ft., the internal dimension of the base is 16 ft. square, and the walls 3 ft. thick. The bricks are supplied locally from Mr. J. Terry's brickfield, and the facing will be of Kentish rag-stone. Surmounting the tower will be a spire coated with copper.

WESLEYAN CHURCH HALL, NEW BRISLINGTON.—A new Wesleyan hall is to be erected for the Wesleyan Methodists of the Bedminster Circuit. The site is at the junction of Sandy Park-road and Wick-road. It is proposed to erect at present a hall to seat 400 persons, and adjoining it will be four other rooms. One of these is intended for an infants' school, and the others for Bible class and institutional work. The two large rooms in the front can be opened into the hall so as to increase the accommodation to 550. The design for the scheme is the work of Messrs. La Trobe & Weston. It is intended to be carried out in pennant and Bath stone, and the total cost, including a portion of the land, furnishing, etc., will be about 3,000*l*.

FORESTERS' HALL, GRIMSBY.—A Foresters' hall is being erected in Garibaldi-street, Grimsby. It has a frontage of 30 ft. and a depth of 96 ft. The ground floor comprises entrance hall, two subscription rooms, cloak-rooms for both sexes, refreshment-room, dressing-rooms, platform, and assembly-room, the latter being 62 ft. by 28 ft. 6 in. The first floor comprises committee-room, waiting-room, stock-room, etc. The front elevation will be built in the best Aston Hall (Cheshire) bricks, with Howley Park stone facings, with a glazed buff dado to first string course. Mr. Herbert Heap, A.M.Inst.C.E., prepared the plans.

CLUB PREMISES, RAMSGATE.—The new Constitutional Club in Cliff-street, Ramsgate, was opened recently. Mr. W. T. Stock, Ramsgate, has been the architect; the contractor being Mr. A. E. Goodbourn, Ramsgate.

FOLK HALL, EARSWICK.—A hall, which is to provide accommodation for the village club, and a large hall for entertainments, fitted up with a stage at one end and capable of holding from 300 to 350 people, is being erected at Earswick. The work is being undertaken by the estate building staff, supervised by the clerk of the works, Mr. G. B. Brown, and the plans have been executed by Messrs. Barry Parker & Raymond Unwin, architects to the Garden City of Letchworth.

W. H. SMITH MEMORIAL HALL.—On the 3rd inst. Lord St. Aldwyn opened the W. H. Smith Memorial Hall and Club, which had been erected within a few yards of Kingsway. The building, which, with the site, is estimated to be worth 12,000*l*., comprises three floors, and includes a billiard-room and a large hall between 50 ft. and 60 ft. long, which will be used for concerts, lectures, and partly as a reading-room. Mr. Allen Vigers acted as hon. architect.

COTTAGE HOMES, CROYDON.—New cottage homes have been erected in the grounds of the Croydon Workhouse. The playgrounds have been laid out by Mr. G. Young, of Croydon. They are partly asphalted and partly gravelled, and are enclosed by a 6-ft. oak pale fence, erected by Mr. G. T. Hall, of Gipsy-hill, S.E. The tender of Mr. Everitt, of Croydon, for the erection of the homes was accepted. The homes have been designed and the work superintended by Mr. J. Hatchard Smith, architect. Mr. Fenn, of Croydon, acted as clerk of works.

MISSION HALL, TORQUAY.—The Bible Christian Mission Hall, in Higher Princes-road, Ellacombe, Torquay, was opened on the 4th inst. The exterior walls are of limestone with brick coigns. In the interior the seats are of pitch-pine, and accommodation is provided for about 300. Underneath is to be a room for a Sunday-school. The building has been erected by Mr. S. C. Eales, from the designs of Mr. E. Westlake.

CLUB PREMISES, HONLEY.—The new Liberal Club which has been erected in Cuckoo-lane, Honley, was opened on the 7th inst. by Sir James Kitson, Bart., M.P. Mr. J. Berry was the architect of the work.

HOME FOR WIDOWS OF SEAMEN, EGREMONT.—The Andrew Gibson Home for the widows of merchant seamen is now almost finished. The architect is Mr. Arthur P. Fry, of Liverpool. There are basement, three upper floors or stories, surmounted by a suite of garret rooms. In the basement the matron will take up her living quarters; there will be a kitchen, a wash-house, a laundry, and the heating apparatus. On the ground floor there are thirteen residential quarters for the widows, each one consisting of a living room partitioned off from which there is a bedroom. The quarters are on each side of a concrete corridor 7 ft. wide. There are also a cooking-kitchen, a bathroom, and a common-room, with accommodation for the whole of the residents. In addition there are the usual sanitary offices. On each of the other two two floors there are fifteen suites of rooms divided by a similar corridor running from one end of the

building to the other, and also having cooking-kitchens, bathrooms, and lavatories. The top story will be occupied by servants. The whole of the building is constructed of red stone and bricks from the works of Messrs. Middlehurst & Co., St. Helens, and the roofing is of green Westmoreland slates. The contractor is Mr. Isaac Dilworth, of Wavertree.

ISOLATION HOSPITAL, TEIGNMOUTH.—A new isolation hospital has just been opened at Teignmouth. The building is erected on the Bitton grounds, fenced off from the remaining portion with Jarra wood, whilst the entrance is from the main road to Newton. The hospital block consists of two wings, each comprising a male ward (two beds) and a female ward (two beds), nurses' duty room, ward kitchen, bathroom, sink chamber and storeroom. There is an administration block or residence for the matron, nurses, and other officials, containing five bedrooms, three sitting-rooms, kitchen, scullery, bathroom, and two small store-rooms. The third block comprises a laundry, disinfector with two chambers for infected and disinfected goods, mortuary, ambulance-shed, and small store. The wards in the main building are 24 ft. by 13 ft., the length of the whole being 140 ft. The area of the ground enclosed is about 1¼ acres, whilst the total cost of the work, exclusive of the purchase of the land, has been 2,630*l*. Mr. C. F. Guttings, surveyor, prepared the plans, and the contractor was Mr. S. Marshall.

NEWSPAPER OFFICES, BELFAST.—New offices have been erected for the *Irish News* in Donegall-street, Belfast. The contractors for building were Messrs. Thornbury Brothers, Ltd.; the steel work was by Messrs. Ritchie; and strong-room doors, etc., by Messrs. Milner. The plumbing work has been carried out by Messrs. J. Baxter & Co.; and the patent glazing by Messrs. Pennycook. Mr. Joseph Downey acted as the clerk of works; and the entire work has been carried out from the design and under the supervision of Mr. J. J. M'Donnell, architect.

CLUB PREMISES, DARLINGTON.—In connexion with St. Hilda's Church, Darlington, a new institution was recently opened. The building, which stands at the rear of the church in Park-gate, and replaces a former club, has been erected by Mr. T. Robinson, builder and contractor, from designs by Messrs. Kitching & Lee. It is of brick, with stone facings. On each story is a billiard-room, and a reading and recreation-room, the upper set being for the men and the lower set for the boys.

WESLEYAN METHODIST BUILDINGS, STEPNEY.—The foundation stone of the new Methodist premises which are to supersede the Stepney Temple, Commercial-road, were laid recently. The new buildings are from designs prepared by Messrs. Weir, Burrows & Weir, architects, of Westminster, and are being erected by Mr. G. Parker, of Peckham.

BOWLING CLUBHOUSE, BELMONT.—A new club-house has been erected for the use of the members of the Belmont Bowling Club. The architect is Mr. C. A. Aickin, the builder being Mr. Kirker G. Walker, Jonesboro'-street, and Mr. Stanley Johnston had charge of the plumbing work.

PUBLIC LIBRARY, ROYTON.—A new public library is in course of erection at Royton. The materials employed are Ruabon bricks, with polished Stancliffe stone dressings. Internally the joinery and fittings will be principally in fumed and dull wax polished oak. The general contract has been secured by Messrs. Whitworth, Whittaker & Co., Oldham, the chief sub-contractors being: for mason work, Mr. Alex. Mackay, Oldham; for joiners' work, Messrs. Ledger & Saville, Royton; and for plumbers' work, Mr. J. W. Kent, Royton. The furniture contract is being carried out by Messrs. Ashton, Leach & Cumberbitch, Ltd., Rochdale, and the total cost is to be 3,500*l*. The architects are Messrs. S. Butterworth & Duncan, Rochdale, whose design was selected in the recent competition.

Y.M.C.A. PREMISES, EALING.—The Duke of Argyll laid the foundation-stone of the new Young Men's Christian Association buildings at Ealing on the 7th inst. The new premises will consist of four floors, comprising reception hall, assembly hall, reading rooms, games room, library, class rooms, and gymnasium. The building is designed by Mr. W. A. Pite, F.R.I.B.A., and will cost over 6,000*l*.

PUBLIC LIBRARY, WEST ISLINGTON.—The foundation-stone of the public library at Thornhill-square was laid a short time ago. The architect is Professor Beresford Pite, the builders being Messrs. Chas. Dearing & Sons, of Islington.

HALL, ST. OSWALD'S, CHESTER.—A parish hall has recently been erected for this parish on land at the west end of the parish church. The building has been designed in the Gothic style to harmonise with its position near the church. The building has been erected from the designs of Mr. H. Beswick.

PAVILION, BRIDLINGTON.—The Lord Mayor of London recently opened the new sea defence works and the new Grand Pavilion at Bridlington. In 1903 the Town Council decided to extend the parade northwards and seawards, and to enclose a part of the foreshore. It was also decided to construct a Grand Pavilion on this extension with accommodation for 3,000 people, also to erect a large café adjoining this pavilion. The whole of this work has now been completed at a cost of about 40,000*l*. Mr. E. R. Matthews, A.M.I.C.E., the Borough Engineer, designed and superintended the construction of the engineering portion of the work, amounting to over 26,000*l*., and Messrs. Mangnall & Littlewoods, architects, of Manchester, designed and superintended the erection of the Grand Pavilion and Café.

CLUB, HONLEY.—New premises erected for the accommodation of the Liberals of Honley were opened recently by the Right Hon. Sir James Kitson, Bart., M.P. The new building has a frontage of 43 ft. to Cuckoo-lane. In the basement provision has been made for caretaker's quarters, consisting of living-room, scullery, and two bedrooms. On the ground floor there is a large billiard-room, with two tables; smoke-room, reading-room, committee-room, and lavatory. The first floor contains lecture-room, games-room, two bathrooms, and secretary's office. Adjoining the club is a bowling-green. The cost of the building will be about 1,700*l*. The following are the contractors for the various works: Masons, Messrs. R. Jenkinson & Sons; joiners, Messrs. Ben Oldfield & Co.; plumber, Mr. Harry Webster; plasterer, Mr. Shaw Whitehead; painter, Mr. F. B. Hinchcliff, all of Honley; concreter, Mr. John Cooke; electrician, Mr. T. W. Broadbent; and hot water engineer, Mr. T. H. Rayner, all of Huddersfield. The plans were prepared by Mr. Joseph Berry, Huddersfield, and the work has been carried out under his supervision.

SPINNING MILL, STOCKPORT.—The corner-stone of a new spinning mill has just been laid at Stockport. The main building will be 233 ft. in length, by 100 ft. in width inside, and five stories in height, in addition to the basement, which extends under the whole of the building. The two first stories will be extended in width by an annexe along the northerly side, 174 ft. in length and 48 ft. in width, with steel stanchions between the main building, and the annexe carrying the walls of the three upper stories. The whole of the buildings, with the exception of the roofs, will be fireproof throughout, on Messrs. Stott & Son's principle, with cast-iron columns, steel girders, and concrete flooring. The contractors for the buildings are Messrs. T. & W. Meadows, of Heaton Norris, who also built No. 1 Mill from the designs of the same firm of architects, Messrs. Stott. Mr. E. L. Hughes was the clerk of the works.

HOME FOR BOYS, BOLDON.—A church home for boys has been erected on a site on the road leading from East to West Boldon. The contractors for the work are Messrs. D. & J. Ranken, of Sunderland, and the architects Messrs. W. & T. R. Milburn.

HOSPITAL EXTENSION, EDINBURGH.—At a meeting of St. Andrews District Committee, held on the 9th inst., it was resolved, on the recommendation of the Joint Committee for the Erection of the Northern Hospital, to appoint Mr. W. Carruthers Laidlaw, architect, Edinburgh, to be architect for the building. Certain structural alterations were agreed to which will reduce the cost by 686*l*. The amended estimate of the building amounts to 4,095*l*.

MISSION HALL, ELLACOMBE, TORQUAY.—A mission hall erected by the Bible Christian Methodist sect in Higher Princes-road, Ellacombe, was opened recently. The exterior walls are of limestone, with brick coigns, and over the entrance are three coloured windows. The seats are of pitch-pine, and accommodation is provided for about 300. Underneath is to be a room for a Sunday school. The site has a frontage of 125 ft. and a depth of 110 ft. The building has been erected by Mr. S. C. Eales, from the designs of Mr. E. Westlake.

PAVILION, TUNSTALL PARK.—The new pavilion overlooking the two bowling-greens in Tunstall Park was formally opened recently. The cost of the building, exclusive of foundation, is 225*l*., and the work has been carried out by Mr. Charles Smith from the designs and under the superintendence of Mr. A. R. Wood, architect and surveyor, who is responsible for the laying out of the park.

NEW OFFICES FOR LONDON, EDINBURGH, AND GLASGOW ASSURANCE CO.—This company intend to erect new offices facing the Euston-road, to stand back 50 ft. from the footpath, and occupy a position comprising the whole of the west side of Euston-square, with a return frontage at the widest part of Euston-road, where there is a clear width of 160 ft. between the buildings. The main front of the office building will eventually face Euston-road, and will be entered near the corner of Euston-square. The main office blocks will constitute two sides of a quadrangle in arrangement, thus furnishing two great Halls at right angles to each other, with windows on both sides. The new building will be of Portland stone. Professor Beresford Pite, is the architect. The site for the new building is now being cleared; the contract has been secured by Mr. Gray Hill, of Coventry, and it is expected that the foundation stone will be laid towards the end of October, and that the company will be in occupation of the new premises by September, 1907.

Stained Glass & Decoration.

MARBLE FLOOR, ST. ANNE'S CATHOLIC CHURCH, BUXTON.—The wooden and stone steps of the sacrarium of this church have been replaced by a marble floor with a mosaic predella. The marble steps, three in number, are of dark grande antique Belgian marble, and are surmounted by the mosaic panel of the predella, forming a platform for the celebrant, as wide as the altar frontal. The design of this mosaic has been framed on the lines of a pavement (now existing) in Canterbury Cathedral, adjacent to the site of the Shrine of St. Thomas of Canterbury. Messrs. Burgess & Mills, marble and mosaic workers, of Manchester, have executed the work, the architects being Messrs. C. & C. M. Hadfield, of Sheffield.

Sanitary and Engineering News.

WATER SUPPLIES IN SURREY.—The Medical Office of Health for the County of Surrey, in his annual report just published, says that the county water map, which was originally prepared in 1896-7 with the co-operation of the officials of the companies and with the assistance of an expert draughtsman, has been brought up to date, and now shows the areas of the companies or district authorities furnishing supplies, their mains, their reservoirs, and their pumping stations. The information is of general interest, and it is believed will be found useful to persons who are about to take up residences in the county. It is intended that the map shall be kept up to date year by year. The map is on view free of charge in the County Medical Officer's room in the County Hall, Kingston.

CROWN PROPERTY AND SANITATION.—A circular letter has been sent by Islington Borough Council to the other metropolitan borough councils, asking them for their support of the following resolution, which was recently adopted at a conference convened by Islington Borough Council:—"That in the opinion of this conference it is undesirable that any lands or buildings situate in the County of London should be exempt from the provisions of the Public Health (London) Act, 1891, or from the sanitary provisions of the Metropolis Management Acts, or from the by-laws made thereunder, and that a memorial be addressed to His Majesty's Government urging them to introduce a Bill to ensure that all lands and buildings owned by or on behalf of the Crown, or at present otherwise exempt, are brought within the provisions of the said Acts and by-laws." When the replies have been received the Prime Minister is to be asked to receive a deputation in support of the memorial referred to.

PROPOSED NEW WATER SUPPLY, BIRKENHEAD.—The source of the new water supply which is proposed for Birkenhead is the mountain moorlands of mid-Denbigh draining into the river Alwen, from which, under the three separate schemes into which the project is divided, it will be possible for Birkenhead to draw off daily either seven millions, fourteen millions, or eighteen and a-half millions of gallons of water accordingly as the requirements grow. Mr. G. F. Deacon, LL.D., M.Inst.C.E., is the author of the scheme.

LEEDS WATERWORKS.—At a meeting of Leeds City Council recently Mr. J. H. Armitage moved that the Council approve the acceptance by the Waterworks Committee of the tender of Messrs. Clayton, Son, & Co., Ltd., for the supply of about 11¾ miles of steel pipes intended to be laid between Kettlesing and Kirkby Malzeard, for the sum of 69,435*l*. 8s. This was the beginning, he said, of the second step which the Council had to take in the construction of an aqueduct to bring the water from the new works in the Ure and Colster Valleys. The first step was the making of the Kettlesing tunnel, which was 5,000 ft. in length, and had to be made because the water could not be carried over the hill by gravitation. The second step was the laying of a double line of pipes over 22 miles long. The Waterworks Committee now proposed to let by tender 11¾ miles. That was about a quarter of the whole work. The Bradford Corporation, under the guidance of their able engineer—Mr. Watson—were the first Corporation in the country to adopt the plan of laying a steel aqueduct, and since then other engineers had followed suit. When the work was complete Leeds would have the longest steel pipe line that had so far been laid. The result of inquiries from engineers and other investigations was to show that steel was preferable to cast-iron on three out of four of the points he had named. Alderman Currer Briggs seconded the motion, which was carried unanimously.

DEVONPORT DOCKYARD.—An extensive installation of electrical lighting and power is being carried out under the general superintendence of Messrs. Preece & Cardew, consulting engineers to the Admiralty. The generating-station near Keyham-yard has been built by Messrs. Lapthorn & Co., of Plymouth; the cables, to the length of

100,000 yds., have been laid by Messrs. Henley & Co., and the British Westinghouse Electric and Manufacturing Company furnished the motors. The lighting apparatus, equipped by Messrs. Edmundson & Co., Messrs. Crompton & Co., and Messrs. Foot & Milne, comprises 160 arc lamps of 5,000 candle-power a-piece for out-door operations, and about 200 arc lamps of from 1,500 to 2,000 candle-power, together with 4,000 incandescent lamps, in the workshops and offices.

Miscellaneous.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. Roger Smith & Son, of 130, Temple Chambers, Whitefriars, E.C., have taken into partnership Mr. Harold E. Church, A.R.I.B.A., as from July 1st.——In reference to the recent death of Mr. Bradley Batsford, the head of the well-known architectural publishing firm, we may mention that the business will be carried on by the younger brother and surviving partner, Mr. Herbert Batsford, assisted by his nephew, Mr. Harry Batsford, and by Mr. Smith, the head of the staff, under the old style of "B. T. Batsford."——Messrs. Ford & Walton, builders from the West End-lane to 242, High-road, and contractors, have removed their offices Kilburn.

ROAD IMPROVEMENT IN BETHNAL GREEN.—The Works Committee of Bethnal Green Borough Council reported on Tuesday that the total cost of the Cambridge-road improvement was 32,673*l*., as against the London County Council estimate of 48,600*l*. The whole of the paving and engineering work had been carried out by the Borough Engineer and Surveyor (Mr. E. E. Finch, Assoc. M.Inst.C.E.) at a total cost of 5,083*l*., which was considerably below the amount included in the original estimates of the London County Council. The Committee expressed their appreciation of the services rendered by Mr. Finch and the expeditious and economical manner in which he carried out the portion of the work entrusted to him.

A HUGE CONCRETE RETAINING WALL.—Geologists show that the recession of Niagara Falls is due to the gradual destruction of the shales underlying the limestone rock, which, at the edge of the falls, has acquired the form of a shelf-like projection, and is gradually breaking away. Similar deterioration of the shales has been evidenced in the lower portion of the cliff rising vertically behind the power-house of the Niagara Falls Hydraulic Power and Manufacturing Company in the gorge below the upper steel arch bridge. Feeling that the continued destruction of the shales under the action of rain and frost will sooner or later induce the fall of rock from the cliff, thus endangering the retaining walls of the forebays, and presenting a serious danger to buildings and workmen engaged on the premises, the company decided to face the cliff for its entire height with a concrete retaining wall. The cliff had previously been faced up to the shale by a concrete wall which has been incorporated in the new work, and suitably strengthened by the addition of massive buttresses. The complete wall extends for a length of 200 ft. along the cliff, and is 200 ft. high. It is composed of 1 : 3 : 5 concrete, and varies in thickness from 2 ft. to 12 ft. Experiments show that no danger is to be anticipated from ice behind the wall, as the temperature of the rock at the surface is never below 39 deg. F. under the most severe conditions. Provision is made for the removal of water by numerous weep holes, and in one part of the wall an arch has been constructed over a natural grotto, whence proceeds a spring of water. The wall contains 7,000 cubic yds. of concrete, all of which was mixed on the edge of the cliff and delivered by means of shoots to the required positions.

UNION BRIDGE, ABERDEEN.—We understand that the Town Council have adopted a scheme proposed by Sir Benjamin Baker for widening the bridge by means of steel girders, at a cost of nearly 10,000*l*.

PATENTS AND "SEARCH FOR NOVELTY."—In his Report for the year 1905, which is just issued, the Comptroller-General of the Patent Office makes some observations upon the new procedure. He says that in the endeavour to avoid the prescribed reference in the specification to any previous invention the tendency has been to define more clearly and particularly the features of the invention which the applicant has added to the stock of knowledge in the art concerned, and that the general effect has undoubtedly been to improve the specification. The examining staff, increased in the twelve months from 110 to 129 (and to be further increased in the current year), have carried out their new labours with less difference of opinion between the officials and the applicants or their representatives than might have been expected, regard being had to the great changes of procedure introduced under the Act of 1902, which was lately put into force. In a very large number of cases no hearing before the Comptroller was found necessary, the requisite amendments having been made by the applicant or his agent either directly in response to the official communication notifying anticipation of invention or after conference with the examiner. During 1905 the examiners made in 10,379 cases the investigations as to novelty prescribed by the Act. In over 60 per cent. of those applications it was reported that the invention had been wholly or partly anticipated, and in the great majority of those cases the specification was amended. When the applicant and the examiner disagreed in that respect, or when the applicant took no action within the statutory period, a hearing was fixed. Of 1,335 hearings arranged for determining whether a reference to any prior specification ought to be recorded in the patent by way of notice to the public, 532 were rendered unnecessary through the abandonment in 108 cases of the claim and in 424 cases of the amendment of the specification before the day of hearing. Formal decisions were given in 803 instances, the reference was ultimately made in 154, and only one appeal (as yet not decided) from those decisions has been made to the Law Officers. The total receipts for the year amount to 265,740*l*. 4s. 9d., including 238,047*l*. 8s. 8d. for patent fees; the payments show a surplus of 106,444*l*. 4s. 10d. after allowance of 91,232*l*. 19s. 7d. for salaries and 2,897*l*. 17s. 6d. for the new buildings in Furnival-street, Holborn, which it is expected will be completed some twelve months hence.

A TECHNOLOGICAL DICTIONARY.—For the *Technolexicon* of the Society of German Engineers about 2,000 firms and individual collaborators at home and abroad are assisting in the compilation. It is to be a universal technical dictionary for translation purposes (in three languages, English, German, and French) and was commenced in 1901. Over 3,000,000 word-cards have been collected. Alphabetising has so far advanced that printing will begin early in 1907. The work will be printed and published by the firm of J. J. Weber, *Illustrierte Zeitung*, Leipzig. Dr. H. Jansen, the editor-in-chief, will be pleased to give any further information wanted. Address: Technolexicon, Berlin (N.W. 7), Dorotheenstrasse 49.

HOMES OF CELEBRITIES.—A fund of 4,600*l*. is being raised for the purchase of the house inhabited by Keats in Rome, and its conversion into a museum and memorial of Keats and of Shelley. The trustees of the fund anticipate that the graves of the two poets will be committed to their care. We may mention here that some years ago, in order to meet demands for further house accommodation, the Municipality of Rome built some artisans' dwellings near Monte Testaccio, and made a scheme for the laying out, as an approach thereto, of a wide road through the old Protestant cemetery outside Porta Ostiensis—now the Porta S. Paolo—with a gate in the city wall of Aurelian, adjoining the sepulcrum Cestii, or pyramid of Caius Cestius. They, however, modified their plans so as to leave untouched the adjacent grave of Keats (near the pyramid), which they enclosed within a small railed garden; in a grave close by Trelawny laid the ashes of Shelley.—The Corporation of Bath have placed a memorial tablet to Henry Fielding and his sister Sarah upon the wall of Widcombe Lodge in that city.—At the recent annual meeting of the Dove Cottage, Grasmere (Wordsworth), National Trust, under the presidency of Professor Knight, it was reported that the property is in excellent order, and during the twelve months ended May 1, 1906, 4,250 tickets of admission to the cottage were sold, being 95 more than in any previous year, and 463 more than in the last preceding period. The cottage working account shows a balance of 40*l*. 19s. 4d., which enables the trustees to add to the invested capital fund.

BISHOP'S SAFETY STAIR TREAD.—This is a stair tread formed of Limmer's asphalt surrounded by a metal frame, within which is an expanded mesh through which the asphalt is run. The expanse on the surface of the step is very narrow, being only the edge of a containing plate of metal which forms part of the riser; treads which depend largely upon metal are always apt to get slippery after a certain amount of wear. The non-slipping quality of the asphalt surface seems as perfect as it could well be, and where appearance is not an important consideration this may be recommended as one of the best and probably one of the most durable of non-slipping treads; and it can easily be applied also to stone steps that are worn, by packing them up with cement to form a level bed for the asphalt tread. It is not an attractive looking step, being rather dingy in appearance, but its practical merits are undeniable.

IRISH INTERNATIONAL EXHIBITION, 1907.—A committee is formed for the Fine Art Section of the Exhibition at Dublin to embrace modern works by British and foreign painters, water-colours, and miniatures, with architectural drawings and examples of British sculpture. Mr. Lionel Cust, Director of the National Portrait Gallery; Mr. C. F. Corbould-Ellis, Chairman of the Corporation of London Art Gallery Committee; Mr. G. J. Frampton, R.A.; Sir Charles Holroyd, Director of the National Gallery; Mr. Whitworth Wallis, Director of the Birmingham Gallery; Mr. A. G. Temple, Director of the Guildhall Gallery; Sir Isidore Spielmann; and Mr. Philip Norman, Treasurer of the Society of Antiquaries, constitute the committee.

PLAYGROUNDS.—A memorial has been addressed to all educational authorities in England and Wales by the National League for Physical Education and Improvement, of Vauxhall-bridge-road. The memorialists state that the London County Council will now consider proposals for the use of their school grounds and that a playground committee of the League has been formed to acquaint all accredited bodies engaged in social work in London of that fact, and to ask all local education committees throughout the country to contribute to an extension of the movement and thereby afford facilities to the boys and girls employed in factories and workshops to engage in organised games in open playgrounds and under efficient leadership.

A CORRECTION.—In "Some Notabilia," page 40 *ante*, of "Notes on Old London," the two houses leased by Sir Edmund Verney were inadvertently mentioned as being at the east end of (Great) Russell-street. They were at the *west* end of that street, and on the *east* side of the Piazza.

CONSISTORY COURT OF LONDON.—At a sitting of the Court on July 12, Dr. Tristram, K.C., Chancellor of the diocese, granted a faculty upon the petition of the vicar and churchwardens of St. James the Great, Bethnal Green, for the erection of an iron chancel-screen 3 ft. 6 in. high, with gates, and the conversion of the south transept into a side chapel, to be separated by means of trellis-work from the remainder of the church. The learned Chancellor also decreed the issue of a faculty in respect of considerable improvements which it is proposed to carry out at Christ Church, Hornsey, at an outlay of about 2,500*l*. The alterations will add 120 to the present 600 seats, and comprise a widening of the north aisle from 9 ft. 6 in. to a total width of 23 ft., the alteration of the vestry in the tower for a clergy vestry and the building of a large choir vestry, with porch, to serve also for classes, meetings, and similar purposes; two new porches at the west end, rearrangement for new clergy and choir stalls; shifting of the pulpit from the north to the south side of the chancel; improved means of heating and electric lighting; and insertion of leaded lights in the windows of the clear-story. Christ Church was built in 1861-2 after Sir A. W. Blomfield's designs in the Early English style; the church was enlarged five years subsequently, and the spire was erected in 1873. St. James the Great, commonly known as the Red Church, was built in 1843-4, after Blore's designs.

JEWISH MUSEUM AND LIBRARY, UNIVERSITY COLLEGE, LONDON.—The library and museum founded by the late Mr. F. D. Mocatta, was inaugurated by Lord Reay, President of University College, on July 11. Mr. Mocatta's collection is temporarily housed in the College library, and constitutes the nucleus of a museum of Jewish antiquities and of a Jewish library. The present exhibits consist of 4,600 books and MSS., which will hereafter be placed in cases which are included in the bequest. A first cheque for 2,500*l*. was handed to Lord Reay towards the endowment fund. The Chief Rabbi announced that Professor Flinders Petrie had presented to the Mocatta Museum the marble column brought from the Temple of the High Priest Onias, and Professor Petrie, in describing some recent discoveries of the temple of Onias and the camp of the Hyksos, maintained that the statements of Manetho and Josephus which have been questioned are thereby confirmed.

BIRMINGHAM ART GALLERY.—At the recent dispersal by auction of Mr. H. Quilter's collection, a small replica of Ford Madox Brown's "Work" was purchased for 390 guineas for the Gallery—the larger version of the picture is in the Manchester Gallery. Miss Albright has presented a landscape in oils by Mr. Bertrand Priestman, and a body of subscribers have given upwards of 300 studies and drawings in water-colours, pencil, pen and ink, and chalk, by Sir John Millais, Fredk. Sandys, and Ford Madox Brown, in addition to the gift made three years ago to the Corporation by other subscribers of some drawings and studies by Sir E. Burne-Jones and Rossetti which had formed a portion of the same collection.

HAMPSTEAD-ROAD (SOUTH END).—Demolition is in progress on the east side for a widening of the street at the junction with Euston and Tottenham Court roads. The early aspect of that spot is depicted in Hogarth's "March of the Guards to Finchley," painted in 1750. In the foreground are seen the site of Tottenham Court Nursery and Broughton's boxing amphitheatre, with the Adam and Eve tavern, of which the sign still distinguishes the public-house at the corner, west, of Hampstead and Euston roads. Hogarth disposed of his picture by lottery; a parcel of unsold tickets—amongst them being the prize-number—he gave to the Foundling Hospital, where it is preserved.

Legal.

OBSTRUCTION OF THE LIGHT OF ST. GEORGE'S CHURCH, HANOVER-SQUARE.

MR. JUSTICE SWINFEN EADY, in the Chancery Division on the 14th inst., delivered his considered judgment in the case of Anderson and others *v.* Francis & Adams, the action brought by the plaintiffs, the Rector and Churchwardens of St. George's Church, Hanover-square, for an injunction to restrain the defendants, the owners and occupiers of Nos. 40, 42, and 44, Maddox-street, W., from heightening the roof of their building so as to obstruct or diminish the light of the church. (The facts of the case and the evidence were fully reported in last week's issue of the *Builder*.)

His lordship, in giving judgment, said in this case the rector and churchwardens of St. George's, Hanover-square, claimed an injunction to restrain the defendants from building so as to obstruct the ancient lights of the parish church. The defendants denied that they were increasing the height of their new building in such a manner as to give the plaintiffs any legal ground of complaint. It was not denied by the defendants that their new building would cause some obstruction. The only dispute was as to the extent of the obstruction. The question which he had to determine was whether the effect of the defendants' new building would occasion a nuisance to the plaintiffs—an illegal obstruction to the light of the church; whether the church would thereby be so darkened as to interfere materially and substantially with the use of it as a building for public worship, and with the comfort and convenience of the worshippers, and of those who ministered in it. It was decided in the House of Lords in the Colls case that it was not sufficient for a plaintiff to show that there had been some appreciable diminution of light to entitle him to an injunction, the deprivation of light must be such that, having regard not only to the amount taken, but also to the amount left, and to the situation and surroundings of the buildings, the obstruction complained of amounted to a nuisance. The architects called by the plaintiffs said that the church was not a well-lighted one before the commencement of the defendants' operations, and that if the buildings were completed as proposed the result would be a serious detriment to the church, and a material and substantial interference with the ordinary use of the church. The architects called by the defendants said that the church was an exceptionally well-lighted one, and even if the defendants built their fourth floor as proposed such building would not materially diminish the light. The evidence of the experts on one side was in direct conflict with that of the experts on the other, as it so often was. There was, however, other evidence. The church was situate nearly, but not quite, east and west. On the west it faced George-street, but there were not any windows on that side. On the east the windows were of stained glass. On the north the church was lighted by four windows below the gallery, and by four windows above it, and on the south by a similar number of windows. Having regard to the number and size of these windows, the area of glass was considerable for the floor area of the church, but the important question was what light was derived through those windows? And that did not wholly depend on the area of them. No doubt if the church were situate on an open plain it would be a well-lighted church. The church was bounded on the south by a narrow passage from 9 ft. to 10 ft. wide, and on the south side of this passage at the western end were high buildings from 40 ft. to 50 ft. high. Very little light indeed was obtained through the four western windows on the south side. The photograph No. 3, taken at 9.5 a.m. on July 4—which he was satisfied was fairly taken—showed that these windows were practically valueless for giving light. With regard to the four eastern windows on the south side, there was no obstruction for a considerable distance directly opposite the two upper windows, but the second window was laterally obstructed by a high building, and the two lower windows were partially directly obstructed. The result was that on the south side the light was principally derived from the two upper windows at the east end. The church is bounded on the north by Maddox-street, which was from 28 ft. to 30 ft. wide, and at the western end the building No. 29, George-street varied from about 44 ft. to 52 ft. high opposite the four western windows. The buildings complained of were situate in Maddox-street, and faced the four eastern windows on the north side of the church, and it was through those windows that the church derived its principal light on the north side. The reconstruction in progress involved the demolition of the old third floor, which was an attic, and the building of a new third floor slightly higher and some feet nearer to the church than the old third floor, and the erection of an entirely new fourth floor about 10 ft. above the third floor, and set back about 4 ft. 9 in. This would cut off about 8 degrees of light from the upper windows, but the extent of an obstruction could not be estimated alone by the number of degrees of light obstructed. With a view of making a test a tarpaulin had been placed in the position of the new intended buildings. The rector was present when this tarpaulin was put up, and he described the result as like pulling down a blind so substantial was its effect on the light of the church. It was said that this experiment was valueless, because a person in the church could read equally well after the tarpaulin was put up as before, but it must be remembered that it was on a brilliant day (June 20), between 4.30 and 5.30 p.m. that the test took place, and Mr. Anderson's answer that the test was valueless for the purpose of determining whether a person could read equally well when the tarpaulin was up as when it was down in no way detracted from his evidence that even on that bright summer afternoon the result on the light was most distinctly visible in the church. And it was the light all the year round and not merely at midsummer which had to be considered. The result of the building up to the third floor, as seen by a person standing in the pulpit, was to cut off the sky area for nearly one-third of the gallery windows, and if the fourth floor was erected as proposed it would cut off the remainder of the sky area, and would very materially diminish the light coming to the pulpit, and necessitate the use of artificial light considerably before it would otherwise be required.

Indeed, Mr. Anderson's evidence was that the effect on the light of the church would be truly disastrous if the works were allowed to be completed. The church at the present time had not any light which could be spared. The rector had himself refused an offer to put a stained-glass window where a plain one now was. Dr. Jolley, the organist, said that the keyboard of the organ derived its principal light from the windows in question, and he had noticed how the light, falling on the music, had already been diminished. The organist had already, even at midsummer and on a very bright evening, been compelled to use artificial light when it would not otherwise have been necessary, solely on account of the obstruction caused by the defendants' new building. The verger, Turner, who had given his evidence exceedingly well and without a trace of exaggeration, had his evidence confirmed in a remarkable manner. On May 27 he noticed how dark the church was towards the conclusion of the service and spoke to one of the officers of the church about having artificial light. He was not aware, nor were the plaintiffs, that the defendants were then experimenting with the tarpaulin, and it was not until the close of the evidence, when the last witness, G. H. Adams, was being examined, that the fact came out that Adams was in church on May 27, and that the tarpaulin was being put up by his direction, and he remembered noticing the verger come up and speak to a churchwarden or sidesman sitting immediately behind him. On another occasion, June 29, the tarpaulin was placed in position while the verger was away at dinner and without his knowledge. On his return he noticed how unusually dark the church was at the end opposite the window, and the pew-opener then drew his attention to the fact that the tarpaulin had been put up which he had not previously observed. Again, on June 20, when it was known that the tarpaulin was being experimented with, Turner was at the west end of the church and could not see the tarpaulin itself, but when this was raised and lowered the difference was very noticeable, as when it was raised he saw it throw a shadow over the church, and when it was removed there was a considerable increase in the light. On the other hand the defendants called—besides the evidence of the three architects called in as experts to advise—Mr. Sidney Ewart Adams, the architect who prepared the plans, but his evidence did not assist him. Mr. Adams stated that he considered the light to the church would not have been affected, even if the buildings had been erected as at first proposed before any alterations of the plans. This was manifestly incorrect, and was indeed promptly disposed of by Mr. J. D. Matthews, architect, the next witness called by the defendants, who stated that if the defendants had built according to the original plans the obstruction to the light of the church would have been quite material and substantial, and that he could not agree with Mr. S. E. Adams's view for a moment. In order to assist him in appreciating the evidence, he had twice visited the church and seen the defendants' new buildings so far as erected, and he had seen the tarpaulin in position. As a result of the whole evidence, aided by his inspection, he had no hesitation in coming to the conclusion that if the new buildings were completed as proposed a nuisance would be occasioned; the church would be thereby materially and substantially darkened and the comfort and convenience of the worshippers there and of those ministering in the church would be seriously prejudiced and interfered with, and that enough light would not be left for the comfortable use and enjoyment of the building as a church according to the requirements of ordinary people. He granted an injunction in the form suggested by Lord Macnaghten in the Colls' case. The defendants would be restrained from erecting any building so as to cause a nuisance or illegal obstruction to the plaintiffs' ancient windows, as the same existed previously to the commencement of the alterations in the defendants' buildings, and the defendants must pay the costs of the action up to and including the hearing. There would be liberty to the plaintiffs to apply, not later than three calendar months after receiving notice from the defendants that their new buildings had been completed, for further relief by way of mandatory injunction or damages, as they might be advised.

WEST-END ANCIENT LIGHT CASE.

THE hearing of the case of Sandows, Ltd. *v.* Duveen commenced before Mr. Justice Warrington in the Chancery Division on the 13th inst., an action brought by the plaintiffs for an injunction to restrain the defendants from obstructing their ancient lights.

Mr. W. H. Upjohn, K.C., and Mr. Peterson appeared for the plaintiffs, and Mr. Warmington, K.C., Mr. George Cave, K.C., and Mr. Rolt for the defendants.

Mr. Upjohn, in opening the case, said that the defendants' building was in the course of erection on the well-known site of Gloucester House, at the corner of Piccadilly and Park-lane. The plaintiffs' building was on the opposite side of Park-lane, and extended a considerable distance along Park-lane towards the north. The plaintiff company were the owners of a large block of flats on the opposite side of Park-lane, and running down to Piccadilly. Gloucester House was occupied for some time before his death by the Duke of Cambridge, and there were stables, near by, but apparently the Duke had not used them. This house continued to stand till 1904, when the defendants commenced to pull it down and were now in the course of erecting a block of buildings of a different character on the site. It would be necessary to give a history of the plaintiffs' property, because there seemed to be some question as to the existence of ancient lights on the plaintiffs' property. The old buildings which occupied the site of the plaintiffs' block of flats were numbered 7 to 10 Park-lane on the east side. Some of these houses might have been a century old, and others were about seventy or eighty years. According to their evidence, except for some alterations to No. 10, Park-lane, more than twenty years ago, there had been no alteration to any of these houses, so far as they could find, for forty years past. The freehold of the plaintiffs' property was vested in the Crown, and the freehold of the defendants' property was vested in the Ecclesiastical Commissioners. Before the plaintiffs' old buildings were pulled down, careful plans, elevations and sections were made. After the site had been cleared in 1900 a building agreement was entered into for a building lease of the new premises to be erected on the site of Nos. 7, 8, 9, and 10, Park-lane. The plaintiff company was incorporated in September, 1900, for the purpose of obtaining the benefit of the agreement and for the purpose of erecting flats. The buildings were started directly after. The buildings progressed, and in May, 1901, the first-floor windows were reached. The lease was granted in April, 1902, by the Crown. The lease was for ninety-nine years from July, 1901, at a ground rent of 1,475*l*., and a large sum of money had to be expended in building the flats. The building was completed soon after the granting of the lease. It consisted of six floors of flats, and two complete flats on each floor, a northerly and southerly flat. On the first, second, and third floors there were bay windows, and in each case these windows formed the windows to the reception-room of the flat adjoining and at the rear. The rents were according to the floor on which the flats were situate, and varied from 600*l*. to 820*l*. per annum. At the present moment all the flats were let, and produced a rental of 7,650*l*. per annum, rising to 7,975*l*. per annum. The question of the deprivation of the light to the windows of these flats was, therefore, one of seriousness. In 1904 the defendants pulled down old Gloucester House and very soon afterwards prepared their plans for erecting their new buildings. These plans were submitted to the plaintiffs, and certain modifications were made, but defendants went on with their buildings, and the present action was commenced. The width of the roadway where the buildings were varied from 37½ ft. to a little more. The height of the defendants' buildings was shown on the plan as 98 ft. 3 in., although the top stories were set back. Plaintiffs had set back their buildings 3 ft. from the original buildings, but in the new buildings the bays and entrance-hall projected the 3 ft. to the line of the old buildings.

Mr. Warmington said that he did not accept his learned friend's statement as to the windows.

His lordship said it appeared to him that the question to be decided was one as to the angles of light, and according to the angles of light there did appear to be some sort of interference.

Mr. Warmington said that his case was that

there was no interference with the plaintiffs light.

Mr. W. H. Gibson, an architect and surveyor, assistant to Mr. Chas. A. Doll, an architect and surveyor, of 5, Southampton-street, Bloomsbury, was the first witness called. He said that in April, 1900, he was assistant to Mr. Arthur Green, the Crown Surveyor, since deceased. At that date he made a survey of Nos. 7, 8, 9, and 10, Park-lane, and from that survey he made the plans, elevations, and sections of that property, which had been produced by the plaintiffs, and which had come from the office of the Commissioners of Woods and Forests. In his opinion, Nos. 7, 8, and 9 were old houses, having been erected some sixty or eighty years. No. 10 did not appear to be quite so old.

Mr. Peterson: No, we know now that alterations had been made to that house.

The witness was cross-examined as to his surveying of the property. He said he made his plans, etc., soon after his survey, and put the date on the plans, etc., but Mr. Green signed them. Mr. Green visited the property, but never surveyed them as far as witness knew. Witness visited the houses and went inside them.

Mr. Thomas Henry Watson, architect, District Surveyor of St. George's, Hanover-square, examined, said that when he received the plans made by Mr. Gibson for Mr. Green he went to inspect the buildings, and he could speak of their general accuracy. In his opinion the buildings were old buildings, certainly more than sixty years old.

Cross-examined:

Apparently alterations had been made to several of the windows, the woodwork and brickwork around being modern.

Mr. Stevens, a veterinary surgeon, who formerly resided at No. 9, Park-lane, gave evidence to the effect that from about 1884 to 1900 the windows of the house were not shuttered except each night.

Mr. Gentle, who recollected Nos. 7 and 8, Park-lane since 1868, said he never knew of any alterations to have been made to those premises since that date. The first-floor windows always remained the same.

Mr. Shaw, a builder, said that alterations were made to No. 10, Park-lane in 1883, and continued in the following year.

Mr. E. A. Gruning, Mr. J. Matthews, and Mr. I'Anson also gave evidence in support of the plaintiffs' case.

Mr. E. H. Bousfield, senior partner in the firm of Messrs. Edwin Fox & Bousfield, gave evidence as to the effect the defendant's building would have if completed on the rental value of the plaintiffs' building. He said that in his opinion the defendant's building when completed would have a material depreciative effect on the plaintiffs' flats. The depreciation he had put into figures, and to the best of his knowledge and experience the depreciation would amount to 5 per cent. The gross rental of the flats exceeded £7,000*l.* a year, and after allowing for the rates and taxes his estimate was that the plaintiffs would sustain a capital rental loss of over 4,000*l.*, taken at 13½ years' purchase. The plaintiffs would also sustain a heavy loss if they were to sell the flats.

At the close of the plaintiffs' case his lordship said he should like to hear what Mr. Upjohn had to say in the light of the evidence given.

Mr. Upjohn said his contention was that the right to light was not lost by the pulling down of an old building and erecting upon the site a building of a different character.

His lordship: I am not certain that the decision of the House of Lords in the Colls' case may not have altered that to some extent. Four witnesses have looked at the plaintiffs' building as if it was the old building.

Mr. Upjohn proceeded to cite several judgments of the House of Lords in support of his submission.

The case was proceeding when we went to press.

APPEAL BY A BUILDER AND CONTRACTOR.

THE case of Ward *v.* Green came before the Court of Appeal, consisting of the Master of the Rolls and Lord Justices Moulton and Farwell, on the 17th inst., on the application of the defendant for judgment or new trial on appeal from verdict and judgment at trial before Mr. Justice Phillimore and a special jury in the King's Bench Division.

Mr. Montague Shearman, K.C., and Mr. Rowlatt appeared for the appellant, and Mr. McCall and Mr. Willis for the respondent.

Mr. Shearman, in opening the case, said it was an action brought under the Fatal Accidents Act. It was brought by the plaintiff on behalf of herself and her children, claiming damages from the defendant on the ground that her husband had met with his death owing to the negligence of the defendant or his servants. The case he said had had a most unfortunate history. It had been tried three times, first before Mr. Justice Lawrence, when, after a long trial, the jury disagreed, then before Mr. Justice Wills, when the jury again disagreed, and on the third occasion before Mr. Justice Phillimore, when the jury found a verdict for the plaintiff, assessing the total damages at 500*l.*, and distributing the damages in certain proportions among the widow and children. The only question on the present appeal was that of liability, there being no quarrel with the amount of the damages awarded by the jury. The case was a most unusual one. The London School Board were extending and rebuilding a school in Boundary-lane, Camberwell. They gave the building part of the contract to the appellant, and they also directly gave a contract for the heating apparatus for the building to a firm called Pearsons, Ltd., in whose employment Ward was. Between Ward and the builder, the defendant, there was no contractural relation of any kind. At the time the accident happened the builders had been on the work for about eighteen months, Pearsons having been at work there about six months. The way the accident happened was this: Pearsons sent a number of heavy radiators which required fixing on the upper floors of the buildings. Two small radiators weighed half a ton, and a big one about the same. The floor of the School Board building consisted of girders running from length to length of the building, and between the girders were joists, and each girder with its pair of joists made a rectangle described as a bay. The concrete was laid in the bay by a method of centring. The concrete was put in loose, and the centring kept it in position until it hardened sufficiently for the boards to be taken away. There was a provision in the specification that the centring was not to be struck until seven days after the floors were laid. The concrete was being laid in the bays, and the middle bay was left open because it was necessary that there should be some means of hoisting heavy weights to the top of the building. All the plant for hoisting was the property of the builder. The bay where the accident happened was the last to be laid, and the evidence showed that that took place about January 20, 1904. The centring was struck on January 27, the minimum time allowed. During that day the builders were employed in getting up some heavy hearthstones on to the second floor, and these stones were substantially about the same weight as the radiators. Defendant's foreman was a man named Gilson, and he had employed two men named Coker and Dutton in getting up the landing stones. During the course of the afternoon, Ward, the deceased man, came to Gilson and asked him to lend him two of his men to get up the radiators, and Gilson declined, but he said that when his men knocked off work there was no objection to Pearsons employing at their own expense his workmen to help them. The defendant's men knocked off work at about 4.30 p.m., and then Dutton and Coker were engaged for 3*s.* for the job to assist Ward and another man in hoisting up the radiators. Dutton and a man named Knight remained below, and Ward and Coker went up above. Two radiators chained together were hoisted up above the level of the second floor, and then the men proceeded to unwind the chain, and when the chain had nearly got unwound one of the claws of the radiators struck the cement on which the men were standing. Then the whole thing gave way. Ward falling and being killed, and Coker falling and breaking his leg. The learned Counsel submitted that on these facts there was not the slightest evidence to show that the defendant had been guilty of any negligence, and that judgment should be entered for the defendant.

Mr. McCall submitted that there was clear evidence of negligence on the part of Gilson to go to the jury, and that there was no evidence of contributary negligence on the part of the deceased man

In the result their lordships held that there was no evidence of negligence on the part of the defendant or Gilson, and that there was evidence that the accident was brought about by the contributary negligence of the deceased man. The appeal was accordingly allowed, and judgment entered for the defendant with costs.

THE MAIDENHEAD BUILDING DISPUTE.

THE case of Lanning *v.* Davy & Salter came before the Court of Appeal, consisting of Lords Justices Cozens-Hardy and Farwell, on the 16th inst., on the appeal of the plaintiff from an order of Mr. Justice Darling. The plaintiff also applied for security for costs of the defendants' application for a new trial on appeal from verdict and judgment at the trial before Mr. Justice Darling and a common jury in the King's Bench Division. (The case was reported in the *Builder* of June 30, 1906.)

Mr. G. A. Scott appeared for the plaintiff, and Mr. George Wallace for the defendants.

Mr. Scott, in opening the case said the matter required some explanation. The action was brought by the plaintiff against a firm of architects in Maidenhead for damages for alleged negligence, and for the present purpose it was only necessary to state it was an action in which the learned judge left five specific questions to the jury, with a direction which he (counsel) did not complain of. The learned judge told the jury that if they answered the questions it would dispose of the whole case. There was one incident in the case which made it somewhat different from other actions. During the course of the trial a suggestion was made that the jury should have inspection of certain pieces of the work which were in dispute, and then both sides agreed that three members of the jury should go down to Maidenhead and see the work, and they went and saw the whole of the work. The suggestion in the case was that a house had been built in such a way that the architects had been negligent. When the three jurymen came back they made a report to the other members of the jury. Then the learned judge summed up the case and left the questions he had referred to to the jury. Despite a very hostile summing-up towards the plaintiff the jury took the view of the facts that he (counsel) had invited them to take, and returned every answer in favour of the plaintiff, and awarded him 750*l.* damages. Up to that point he (counsel) had nothing to complain of, but what he did complain of was the next step in the case. The learned judge, having failed to get the jury to adopt his view of the facts, entered judgment and granted a stay of execution to enable the defendants to apply for a new trial. He (Mr. Scott) did not think there was any ground for asking for a new trial except the vague ground that the verdict was against the weight of the evidence. He should contend that there was ample evidence to support the verdict. In these circumstances he protested strongly against the learned judge staying execution without giving the plaintiff some security for the damages pending the time when the application for a new trial was heard in that Court. He submitted that the learned judge had not properly exercised his judicial discretion in the matter. On July 4 he again went before the learned judge, and asked him to make an order that defendants should pay the damages into Court, or otherwise secure the plaintiff's position pending the hearing of the appeal, but the learned judge again refused to do so, and declined to grant him leave to appeal to the Court of Appeal.

After hearing Mr. Wallace on behalf of the defendants Lord Justice Cozens-Hardy, in giving judgment, said that although the learned judge had made an unusual order, he thought it was plainly one which it was within his power to make if he considered the verdict of the jury was perverse. It was clearly competent for the learned judge to grant the defendants an unconditional stay, and, therefore, in his opinion, the present application failed. He also was of opinion that the plaintiff's application failed for the reason that it was out of time.

Lord Justice Farwell concurred, and the appeal and the application were dismissed, the costs to be the respondents' (defendants') in any event.

BURIALS NEAR DWELLING-HOUSES.

MR. JUSTICE JOYCE, in the Chancery Division on the 14th inst., had before him the case of Godden *v.* the Hythe Burial Board.

In this case the plaintiff is the owner of land at Hythe, and in April last defendants acquired a piece of land adjoining that of plaintiff for a burial ground, and in spite of protests from the plaintiff buried a pauper within 100 yds. of a dwelling-house. Mr. Justice Kekewich granted the plaintiff an interlocutory injunction, and the Court of Appeal affirmed his decision on the ground that the Burial Board could not legally bury a person within 100 yds. of a dwelling-house. Counsel now stated that defendants felt that they could not contest the matter further, and in these circumstances Mr. Justice Joyce made the injunction perpetual, and ordered the defendants to pay the costs of the action.

Patents of the Week.

APPLICATIONS PUBLISHED.*

17,490 of 1905.—R. HOSLER: *Cowls.*

THIS invention consists in the construction of vanes, baffle plates, and crown from a single piece of sheet metal, the whole forming the complete revolving cowl-head proper without the use of seams or joints, the said head being supported from a pivoted disc operating over and being the actual cover of an oil cup.

22,024 of 1905.—W. MORGAN: *Hanging Window Sashes.*

This relates to means for mounting and suspending window-sashes and the like, and consists of oppositely disposed flat springs carrying rollers at the extremities, which are fixed on the window sash and press against the frame.

24,919 of 1905.—EVERED & Co., J. WALE & C. HOLT. *Barrel Bolts for Doors and other articles.*

This invention relates to barrel bolts, and consists in making a way or passage for the introduction of the solid bolt proper into the barrel by slitting and opening out the short tubular end of the said barrel at the top or side, the said way or passage being closed after the introduction of the bolt or shoot.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

PATENTS.—*Continued on page 117.*

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, —; Contracts, iv. vi. viii. x.; Public Appointments, xviii.; Auction Sales, xxviii. Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bonâ-fide tender unless stated to the contrary.

Competitions.

JULY 24.—**Salford.**—HOSPITAL EXTENSION.—Salford Royal Hospital Board of Management invite architects practising in the neighbourhood of Manchester and Salford who are willing to send in competitive designs for the proposed extensions of the hospital buildings to forward their names, with evidence of experience, to Mr. George Ruddle, Secretary and Superintendent, Salford Royal Hospital, on or before July 24. Premiums amounting to 100*l.* will be awarded to the three best designs.

SEPTEMBER 29.—**Ellesmere.**—SEWAGE DISPOSAL SCHEME.—The U.D.C. of Ellesmere invite competitive schemes for the disposal of the sewage of the town of Ellesmere. Detailed schemes, plans, and estimates of cost should be sent to Mr. R. E. Lloyd, Clerk of the Council, Ellesmere, not later than September 29 next. The author of the selected scheme must be prepared to attend, at his own expense, the Local Government Board inquiry, and to submit and explain his scheme to the inspector thereat. Upon the sanction of the Board being received (but not otherwise), the author of the selected scheme will be paid, a premium of 20*l.*, and, if the Council decide to carry out the scheme, will be employed as engineer to supervise the execution of the work at the usual professional remuneration of 5*l.* per cent. of the cost, in addition to the premium. The plans, etc., of the scheme executed (if any) shall become the property of the Council.

Contracts.

BUILDING.

JULY 20.—**Sheffield.**—COLLEGE ALTERATIONS.—Sheffield Education Committee invite tenders for the alterations of the old University College buildings in Leopold-street, for the purposes of the Central Secondary School. Send in names to the architects Messrs. Gibbs & Flockton, 15, St. James'-row, not later than July 20. Quantities will be ready July 25. Tenders, on forms and in covers provided, must be delivered at the Education Committee's Offices not later than 2 o'clock on August 3.

JULY 20.—**South Shields.**—ALTERING PREMISES.—Alterations to premises, Nos. 78-84, Victoria-road, South Shields, for a social club for the Marsden and St. Hilda miners. Names to Mr. Fred. Rennoldson, architect, 37, King-street, South Shields, not later than July 20. Bills of quantities will be supplied to such applicants only. The tenders are to be delivered to the Secretary, Mr. J. R. Toll, 28, Maxwell-street.

JULY 20.—**Wakefield.**—HOUSES.—The erection and completion of three houses in Marsland-terrace, Wakefield. Names and addresses to Mr. J. Day, architect and surveyor, Central-buildings, Marygate, Wakefield, not later than 12 o'clock noon, July 20.

JULY 21.—**Allerton.**—STABLE.—The erection of a five-stall stable at Lower Westgate Farm, Allerton. The plans may be seen, and quantities obtained, on application at offices of Jackson & Fox, architects, 7, Rawson-street, Halifax.

JULY 21.—**Farnborough.**—VILLA.—For the erection of a proposed villa, Pinehurst-road, Farnborough. Plans and specification may be seen, and further information obtained, upon application to Messrs. Friend & Lloyd, architects, Grosvenor-road, Aldershot. The tenders are to be sent in to their offices, Grosvenor-road, not later than 11 a.m. on July 21, endorsed "Tender for Villa, Farnborough."

JULY 21-31.—**Hunslet.**—ENGINE-HOUSE, ETC.—Hunslet Guardians invite tenders for the erection of an engine-house and pump-room at their new Workhouse, Rothwell Haigh, in accordance with the drawings and specifications prepared by the architect, Mr. W. E. Richardson, Rothwell, near Leeds. Applications for bills of quantities and forms of tender must be made to the architect on or before July 21, and bills of quantities will be supplied to such applicants only. Drawings may be inspected at the offices of the architect, and tenders, on forms provided, must be delivered at office of Mr. Fred. W. Mee, Clerk to the Guardians, Union Offices, Hunslet, Leeds, by 10 o'clock on July 31.

JULY 21.—**Ludlow.**—VICARAGE HOUSE.—For erection of vicarage house at Ashford Carbonell, Ludlow. Apply to Mr. A. G. Lloyd Oswell, architect, Dana-chambers, Shrewsbury, not later than July 21. Quantities will be supplied on payment of 1*l.* 1*s.*

JULY 23.—**Branderburgh.**—HOUSE.—Estimates wanted for the mason, carpenter, plumber, slater, plaster, and painter work of house to be built in Commerce-street, Branderburgh. Plans and specifications may be seen with Mr. R. B. Pratt, architect, Town and County Bank-buildings, Elgin, who will receive offers not later than July 23.

JULY 23.—**Castlerahan.**—COTTAGES.—Castlerahan R.D.C. invite tenders to repair the several labourers' cottages in the undermentioned Electoral Divisions in above district, viz.:—Ballyjamesduff, Castlerahan, Munterconnaught, Lurgan, Kilbride, and Virginia, according to the specification prepared by Mr. Luke Brady, which can be seen at office of Mr. Peter Brady, Clerk of Council, Oldcastle Workhouse. Tenders will be received by Clerk up to 11 o'clock on July 23.

JULY 23.—**Fowey.**—TAKING DOWN AND BUILDING.—Taking down old and erecting new building in Fore-street, Fowey. Drawings and specifications can be seen on application to Mr. R. Vincent, Manager, Fowey Wint Company, Fowey. Tenders to be delivered to the above on or before July 23.

JULY 23.—**Gunnislake.**—CHAPEL WORKS.—For altering and renovating the Bible Christian chapel at Gunnislake. Plans, etc., may be seen at Mr. Mitchell's, New Bridge-hill, Gunnislake. Tenders to be sent to Rev. E. V. Stephens, Crewslee House, Callington, on or before July 23.

JULY 23.—**Newtown.**—SCHOOL WORK.—Renovating, repairing, etc., Newtown County Intermediate schools. Separate tenders are to be sent in for the carrying-out of the work as follows:—(1) For structural work and repairs; (2) for painting, glazing, distempering, and whitening. Specifications may be seen on application to Mr. Martin Woosnam, Clerk to the Governors, Bank-chambers, Newtown. Tenders are to be sealed, and marked "Tender No. 1" or "Tender No. 2," and are to be received by the Clerk not later than 12 o'clock noon on July 23.

JULY 23.—**Nottingham.**—BUILDING ALTERATIONS.—Building alterations at Bagthorpe Workhouse. Particulars and quantities on application to Mr. Arthur Marshall, A.R.I.B.A., architect, King-street, and on payment to him of a sum of 2*l.* 2*s.* Tenders must be delivered to Mr. G. Muncaster Howard, Clerk to the Board of Guardians, Poor Law Offices, Shakespeare-street, before 12 noon on July 23.

JULY 23.—**Tredegar.**—VILLAS.—The erection of two semi-detached villas for Mr. T. J. Price, Glanyrafon, Tredegar, to whom sealed and endorsed tenders should be sent by July 23. Plans and specification may be seen with Mr. W. S. Williams, architect, etc., Tredegar.

JULY 23.—**Warley.**—ALTERATIONS TO FARM BUILDINGS.—Alterations to farm buildings at Warley. Plans may be seen, and quantities obtained, at offices of Mr. Lister Coates, A.R.I.B.A., architect, Central Chambers, Central-street, Halifax, from July 17 to July 23.

JULY 24.—**Accrington.**—TECHNICAL SCHOOL.—Accrington Municipal Technical School extension. Application by letter to Mr. Henry Ross, architect, 15, Cannon-street, Accrington, before July 24.

JULY 24.—**Halifax.**—EXTENSION OF COLLEGE.—Halifax Education Committee invite tenders for mason's, ironfounder's, joiner's, slater's and plasterer's, and plumber's work in connexion with a proposed extension of the Technical College, Hopwood-lane, Halifax. Plans and specifications may be seen, and forms of tender obtained, on application to Mr. James Lord, C.E., Borough Engineer, Town Hall, Halifax, on payment of a deposit of 1*l.* Tenders, endorsed "Extension to Technical College," must be sent to Mr. W. H. Ostler, Secretary to the Education Committee, on or before noon, July 24.

JULY 24.—**Kingston-on-Thames.**—ALTERATIONS TO HORSES.—The Guardians of the Kingston Union invite tenders for making alterations to two houses, Rhymney and Briarfield, Wolverton-avenue, Kingston-on-Thames, in accordance with plans, etc., prepared by Mr. William H. Hope, C.E. architect and surveyor, Hampton Wick. The plans and specification may be seen, and form of tender obtained, on application to Mr. Jas. Edgell, solicitor, Clerk to the Guardians, Union Offices (opposite Norbiton Station), Kingston-on-Thames between the hours of 9 a.m. and 5 p.m., and until 1 p.m. on Saturdays. Tenders to be delivered not later than July 24, at 12 noon.

JULY 24.—**Lavey.**—HOUSE.—Tenders are invited on or before July 24 from competent contractors for the erection of a dwelling-house at Lavey. Plans and specification to be seen with the architect, Mr. Thos. O'Brien, A.I.S.E., Lavey.

JULY 24.—**Mardy.**—CLUB.—Pulling down and rebuilding the Conservative Working Men's Club, Mardy, Glam., for the Trustees. Plans and specifications may be seen at the club premises, Mardy. Tenders to be delivered to the Secretary, Mr. T. R. Leyshon, Secretary, 24, North-terrace, Mardy, Glam., on or before 6 p.m., July 24.

JULY 25.—**Ashford.**—WALLING.—Ashford U.D.C. invite tenders for the erection of a Kentish rag-stone boundary wall, about 1,200 ft. long, at its cemetery, Canterbury-road, in accordance with plans and specification, which may be seen. Form of tender, and any other information, obtained on application to Mr. William Terrill, surveyor, North-street, Ashford, Kent. Sealed tenders, endorsed "Cemetery Walling," to be sent to Mr. F. Hughes Hallett, solicitor, Clerk to the Cemetery Committee, not later than 5 p.m. on July 25 at his office, 11, Bank-street.

JULY 25.—**Broughton-in-Furness.**—COTTAGES.—The Broughton-in-Furness Co-operative Society, Ltd., invite tenders for the erection of three cottages, the plans and specifications of which will be deposited, and may be inspected, at Mr. W. H. Whinray's, Sandgap Farm. Tenders, sealed, and marked "Tender," to be in the hands of Mr. John J. Singleton, Secretary, not later than 5 p.m. on July 25.

JULY 25.—**Erdington.**—BOUNDARY WALLS.—Erdington U.D.C. Highways and Buildings Committee invite tenders for the erection of boundary walls at their depôt in Spring-lane. Drawings may be seen, and copies of specification, quantities, and form of tender obtained, upon application at office of Mr. Herbert H. Humphries, Engineer and Surveyor, The Council House, The Park, Erdington, where tenders, endorsed "Tender for Walls," must be delivered not later than 12 o'clock at noon on July 25.

JULY 25.—**Kingstown.**—RESTORATION.—For the restoration of Nos. 105, 106, and 107, Lower George's-street, Kingstown, for The Hibernian Bank, Ltd. The plans and specification relating thereto can be seen at office of Messrs. William H. Byrne & Son, architects, 20, Suffolk-street, Dublin.

JULY 25.—**Lancaster.**—RECEPTION HOUSE.—Tenders are invited by the Central Committee of the Royal Albert Asylum, Lancaster, for the erection of a reception house. Plans can be seen at the Asylum, and blank copies of quantities obtained from the Secretary, on payment of 1*l.* 1*s.* Tenders to be sent in to the offices of the architects, Messrs. Woolfall & Eccles, 60, Castle-street, Liverpool, not later than 4 p.m., July 25.

JULY 25 and 27.—**Lesmahagow, etc.**—SCHOOL WORK.—Lesmahagow School Board invite tenders for alteration of front lobby and lavatory at Lesmahagow senior school. Separate contracts for mason, joiner, plumber, and plaster work. Plans may be seen at school on and after July 19, and offers to be lodged with Mr. James N. Gilmore, Clerk, School Board Office, Lesmahagow, not later than July 25, marked "Offer for Senior School." Tenders also invited for new bathroom at Blackwood school-house. Separate contracts for mason, joiner, plumber, and plaster works. Plan may be seen at the school-house on and after July 21, and offers to be lodged with the Clerk not later than July 27, marked "Offer for Blackwood."

JULY 25.—**Norwich.**—BOILER-HOUSE, ETC.—The Guardians of the Poor of the Norwich Incorporation invite tenders for the erection of new boiler-house, seating for boilers, and economiser, at the Norwich Workhouse. Plans and conditions of contract may be seen, and bills of quantities obtained, on payment of 1*l.* 1*s.*, at the offices of Messrs. Morgan & Buckingham, architects and surveyors, 3, Redwell-street, Norwich. Sealed tenders, endorsed "Tender for Boiler-house," to be delivered to Mr. Henry Stone, Clerk to the Guardians, Guardians' Offices, St. Andrew's-street, Norwich, not later than 3 o'clock on July 25.

JULY 26.—**Minehead.**—HOUSES.—Three houses and garage, in the Parks, Minehead, for Mr. J. K. Hoard, Taunton. Sealed tenders to be left at office of Mr. W. J. Tamlyn, M.R.San.I., architect, Minehead, not later than July 26.

JULY 26.—**Youghal.**—HOUSES.—The Youghal U.D.C. invite tenders for the erection of nine houses for the accommodation of the working classes, on Cork Hill, including the drainage, water supply, fencing, and roadway, according to plan and specification, which can be seen at the Town Hall between the hours of 11 a.m. and 4 p.m. Each tender must be accompanied by a schedule giving the quantities and prices, upon which said tender is founded. Each tender is to be on the prescribed form, and is to contain the genuine signatures of two solvent persons willing to enter into a joint and several bond for the due execution of said works within the time specified. Tenders, endorsed "Tender for the Housing of the Working Classes," addressed to the Chairman, Town Hall, to be sent through the post-office not later than the evening of July 26. Mr. James J. O'Shea, Clerk of the Council, U.D.C. Office, Town Hall, Youghal.

JULY 27.—**Orton.**—ANTE-ROOM.—For the erection of ante-room to Inchberry Public Hall, Orton. Plans and specifications may be seen with Mr. A. B. Hunter, Chairman of Inchberry Hall Committee, Orton Station, with whom offers, endorsed "Ante-room," may be lodged, on or before July 27.

JULY 28.—**Ceidio.**—HOUSES.—Two houses for Penlôt Congregational Church, Ceidio. Plans, etc., to be seen at Meillionen, Ceidio. Tenders to be sent in on or before July 28. Mr. Henry Williams, Meillionen, Ceidio, Pwllheli.

JULY 28.—**Mynyddislwyn.**—RESTORING CHURCH.—For restoring and repairing the Parish Church of Mynyddislwyn, near Abercarn, for the Rev. J. Jones Lewis. The plans and specification can be seen, and quantities obtained, at office of Mr. E. M. Bruce Vaughan, F.R.I.B.A., architect, 21, Dumfries-place, Cardiff, on receipt of 2*l.* 2*s.* The tenders are to be delivered at office of architect on or before noon on July 28.

JULY 28.—**Naas.**—CHURCH WORK.—Certain alterations and additions to the chancel, etc., of St. David's Catholic Church, Naas, Co. Kildare, for the Very Rev. Thomas Morrin, P.P. Plans, etc., seen at office of architects. Bills of quantities have been prepared by Mr. D. W. Morris, surveyor, 68, Harcourt-street, Dublin, and can be obtained from him. Tenders to be delivered at the architects' office not later than 12 o'clock noon on July 28. Messrs. Ashlin & Coleman, architects, 7, Dawson-street, Dublin.

JULY 28.—**Penygraig.**—VICARAGE.—Building a vicarage at Penygraig for the Rev. T. E. Griffiths. The plans and specification can be seen, and quantities obtained, at office of Mr. E. M. Bruce Vaughan, F.R.I.B.A., architect, Cardiff, on receipt of 2*l.* 2*s.* The tenders are to be delivered at office of architect on or before noon on July 28.

JULY 28.—**Pontycymmer.**—SCHOOL HALL.—The erection of a school hall, at Pontycymmer, for the English Calvinistic Methodist Church. Plans and specifications may be seen with Mr. Owen Jones, saddler, Pontycymmer, or at office of Mr. Arthur

Lloyd Thomas, A.M.I.M.E., architect and engineer, Church-street Chambers, Pontypridd. Sealed and endorsed tenders to be sent to Mr. Owen Jones on or before July 28.

JULY 30.—**Pontardulais.**—SHOPS, ETC.—Three new shops, altering present shop, and erecting new offices at Pontardulais. Plans and specifications at the offices of Messrs. Williams & Henton, architects and surveyors, Bank Chambers, Heathfield-street, Swansea. Endorsed tenders to be sent to Mr. W. McWilliams, Bank House, Pontardulais, not later than July 30.

JULY 31.—**Wolverhampton.**—HOSPITAL BLOCK.—Wolverhampton Health Committee invite tenders for the erection of additions to the administrative block at the Fever Hospital in Green-lane. Plans may be seen, and specifications, bill of quantities, and form of tender obtained, on application at the Borough Engineer's Office, upon payment of a deposit of 1*l.* 1s. Tenders, addressed to the Chairman of the Health Committee, to be delivered at the Town Clerk's Office by 10 a.m. on July 31.

AUGUST 1.—**Hopkinstown.**—CHAPEL.—The erection of a large chapel and schoolroom for the English Baptist Church at Hopkinstown, Pontypridd. Plans and specifications may be seen at office of Mr. Arthur Lloyd Thomas, A.M.I.M.E., architect and engineer, Church-street Chambers, Pontypridd. Sealed and endorsed tenders to be sent to the Rev. Samuel Davies, Oakfield, Pwllgwaun, Pontypridd, on or before August 1.

AUGUST 1.—**Nottingham.**—MISSION HALL.—New Baptist mission hall, Robin Hood's Chase, Nottingham. Plans and specification may be seen with Mr. Phillimore, 114, Alfreton-street, Nottingham, and at the offices of the architect, Mr. W. Beddoe Rees, architect, 3, Dumfries-place, Cardiff, from whom bills of quantities may be obtained. Tenders are to be sent to the Hon. Pastor, Mr. W. A. Coombs, Rosebolme, Clumber-avenue, Mapperley Plains, Nottingham, on or before August 1.

AUGUST 1.—**Slapton.**—HOUSE.—Erection of a vicarage house at Slapton. Plans and specifications can be seen on application to Mrs Bowles, Carr-lane, Slapton, between the hours of 10 and 4 o'clock, or at the office of Mr. W. F. Tollit, architect, 10, High-street, Totnes, from whom any further particulars can be obtained. Tenders are to be sent to Messrs. Oldrieve & Hingston, Bridgetown, Totnes, on or before August 1.

AUGUST 2.—**Alnwick.**—RESIDENCE.—Tenders are invited in one sum for the trades separately for the works required in the erection of new residence at Alnwick for Mr. Wm. Percy. The plans and specifications may be seen at office of Mr. George Reavell, jun., A.R.I.B.A., Alnwick, and the tenders, duly endorsed, must reach architect not later than noon, August 2.

AUGUST 4.—**Roseudian.**—CATTLE HOUSE.—The erection of a cattle house at Roseudian, in the Parish of St. Hilary, in the occupation of Mr. Benjamin Hocking and the executors of Mr. William Hocking. Plans and conditions and specifications at the farmhouse at Roseudian. Tenders should be sent on or before August 4 to Mr. George Gow, Tregothnan Office, Truro.

AUGUST 6.—**Dumfries.**—PAVILION.—The various tender, etc., can be had upon application at the Crichton Royal Institution, Dumfries. Plans and specifications, etc., can be seen at the office of the architects, Messrs. Sydney Mitchell & Wilson, 13, Young-street, Edinburgh, till July 23, thereafter at the Crichton Royal Institution, Dumfries, on July 24 and subsequent dates. The Clerk of Works will be in attendance at the Institution on July 25, 26, and 27, to give explanations or information necessary. Copies of the specifications and schedules may be obtained on application to Messrs. Sydney Mitchell & Wilson, up to July 19, and tenders must be lodged with them on or before August 6.

AUGUST 15.—**Lostock Hall.**—SCHOOL.—The Lancashire Education Committee invite tenders for the erection of a new public elementary school at Lostock Hall, near Preston. The plans may be seen, and bills of quantities obtained at the office of the County Architect, Mr. Henry Littler, 16, Ribbleadale-place, Preston, by payment of a deposit of 2*l.* Tenders must be delivered before 12 o'clock noon on August 15, sealed and endorsed, to Mr. W. S. Woodcock, Council Offices, Bamber Bridge, near Preston.

No DATE.—**Ballymena, Ireland.**—CHIMNEY.—For the erection of a 60-ft. brick chimney at Aboghill Creamery, Ballymena. Plans and specifications can be seen at Creamery.

No DATE.—**Belfast.**—HOUSE.—For the erection and completion of shop and dwelling-houses, Falls-road, Belfast, for Mr. John Mulholland. Plans, specification, and particulars may be obtained at the office of Mr. W. J. Moore, architect, 35, Royal-avenue, Belfast.

No DATE.—**Bognor.**—SCHOOL ENLARGEMENT.—The Education Committee of the West Sussex C.C. invite tenders for the enlargement of the Council school at Bognor. Particulars, etc., may be obtained from Mr. W. Lewis Barrett, Arcade Chambers, Bognor. Tenders should be sealed and addressed to "The Secretary," West Sussex and Chichester Joint Education Committee, Education Offices, Horsham.

No DATE.—**Brackley.**—HOUSE.—Northamptonshire C.C. Standing Joint Committee invite tenders for taking down and rebuilding the constable's house at Brackley Police-station. Plans can be seen, and quantities obtained, upon application to Mr. C. S. Morris, County Surveyor, County Hall, Northampton.

No DATE.—**Carlisle.**—DRILL HALL.—For the whole or any of the several trades required in the erection of a new drill hall for 1st Cumberland Royal Garrison Artillery Volunteers. Names to Messrs. Oliver & Dodgshun, FF.R.I.B.A., architects, Carlisle. Quantities will be supplied to such applicants only. Sole tenders preferred.

No DATE.—**Crumpsall.**—HOUSES.—For any of the trades required in the erection of eight houses at Crumpsall. Quantities from the architect, Mr. Jesse Horsfall, F.R.I.B.A., 4, Chapel-walks, Manchester.

No DATE.—**Heyrod, Stalybridge.**—CLUB.—For construction of Liberal club at Heyrod, Stalybridge. Plans and specifications may be seen at the Club premises by arrangement. Mr. J. W. Toothill; Hon. Secretary.

No DATE.—**High Wycombe.**—SCHOOL REPAIRS.—Repairs, etc., at Central Schools for the High Wycombe Borough Education Committee. For particulars apply Mr. Thos. Thurlow, architect.

No DATE.—**Hull.**—TANK SHED.—Melville Lenham, architect, etc., 21, Bond-street, Savile-street, Hull, invites tenders for the erection of proposed tank shed, etc., Oxford-street, Hull, for Messrs. J. B. Walker & Co., Ltd. Plans may be seen, and quantities obtained, on application.

* No DATE.—**Leeds.**—PROPOSED MINING AND METALLURGICAL LABORATORIES OF THE UNIVERSITY OF LEEDS.—Builders desirous of being selected to tender for the above should apply in writing (stating whether all or separate trades) to Mr. Paul Waterhouse, architect, Staple Inn Buildings, Holborn Bars, W.C.

No DATE.—**Kirkburton.**—HOUSES.—The several trades required in the erection of nine houses at Kirkburton. Names and addresses to Mr. Henry Wood, Park View, Kirkburton, when quantities will be forwarded.

No DATE.—**Melton Mowbray.**—PREMISES.—The Melton Mowbray Co-operative Society, Ltd., invite tenders for the erection of central premises to comprise four shops, assembly-rooms, warehouse, etc., on their land in King's-road. Builders desirous of tendering may see the plans upon application in writing to the Secretary, at the Society's Office, King's-road, when further particulars may be obtained as to time for delivery of tenders, etc.

* No DATE.—**Mile End.**—BOUNDARY WALL.—Tenders are invited for the erection of a boundary wall at the workhouse in Bancroft-road, E. Forms of tender, etc., can be had upon application at the office of Mr. J. M. Knight, 35, Bancroft-road, Mile End, E.

No DATE.—**Milnsbridge.**—MILL.—Masons and bricklayers, carpenters and joiners, plumbers and glaziers, patent glaziers, iron and steel founders, slaters, concreters, and painters' work required in the erection of mill premises, containing about 5,600 sq. yds. floor area, together with engine-house, staircase, tower, etc., at Milnsbridge. Applications to Messrs. Lunn & Kaye, architects and surveyors, Milnsbridge and Huddersfield, when quantities will be forwarded in due course.

No DATE.—**Stokeclimsland.**—REPAIRS, ETC.—Repairs to dwelling-house and outbuildings on Trehill Farm, Stokeclimsland, including new roof, rebuilding end wall, laying floors to shippens, etc. For full particulars apply to Mr. Sandercock, Trehill.

ENGINEERING, IRON, AND STEEL.

JULY 23.—**Hemsworth.**—HEATING APPARATUS.—The Hemsworth District Sub-Committee of West Riding C.C. invite tenders in connexion with the repairs to be done at the heating apparatus at the Hemsworth Provided school. Specifications may be obtained on application to the Education Offices, Northgate, Wakefield. Sealed tenders, endorsed "Heating Apparatus: Hemsworth," to be sent to Mr. James Whaley, Divisional Clerk, Northgate, Wakefield, not later than 10.30 a.m. on July 25.

JULY 23.—**London.**—INGOTS.—The Bengal and North-Western Railway Company Directors invite tenders for the supply and delivery of copper ingots and tin ingots, as per specification, to be seen at the Company's offices. Tenders, addressed to Mr. Alexander Izat, Managing Director, 237, Gresham-house, Old Broad-street, London, E.C., and marked "Tenders for Copper Ingots," or as the case may be, are to be lodged not later than noon on July 23. For each specification a fee of 10s. will be charged, which cannot, under any circumstances, be returned.

JULY 24.—**Biggin.**—CONVENIENCES.—West Riding C.C. Education Department (Church Fenton District Sub-Committee) invite tenders for the removal and re-erection of conveniences on the premises of the Biggin Provided School. Sealed tenders, to be delivered to Mr. Benj. Sheard, Divisional Clerk, Education Offices, Selby, from whom specifications and quantities may be obtained, not later than July 24.

* JULY 24.—**Ealing.**—REBUILDING BRIDGE.—Tenders are invited for rebuilding Perivale Bridge, Greenford-road. Drawings and specifications may be seen, and forms of tender, bills of quantities, and other particulars may be obtained, from the Borough Engineer, Town Hall, Ealing, W., during office hours, on deposit of 2*l.* 2s. Tenders, endorsed "Tender for Rebuilding Perivale Bridge," to be delivered to the Town Clerk, Town Hall, Ealing, not later than 9.30 a.m., July 24.

JULY 24.—**Featherstone.**—WIDENING BRIDGE.—Lancashire and Yorkshire Railway Directors invite tenders for works, etc., required in widening the bridge carrying Common Side-lane over the railway, at Featherstone. Plans can be seen, and form of tender and specification obtained, on application at the Engineer's Office, Hunts-bank, Manchester. Tenders, endorsed "Tender for Widening Bridge at Featherstone," to be in the hands of Mr. R. C. Irwin, Secretary, Hunts-bank, Manchester, not later than 10 o'clock on July 24.

JULY 24.—**London.**—STEEL BRIDGES.—The South Indian Railway Company, Ltd., invite tenders for the supply of steel bridges, 12 ft. to 70 ft. spans, about 1,340 tons. Specifications and forms of tender may be obtained at the Company's offices. Tenders, addressed to the Chairman and Directors of the South Indian Railway Company, Ltd., and marked "Tender for Bridges," must be left with Mr. Henry W. Notman, Managing Director, Company's Offices, 55, Gracechurch-street, London, E.C., not later than 12 noon of July 24. A charge, which will not be returned, will be made of 1*l.* for each copy of the specification. Copies of the drawings may be obtained at the office of Sir George B. Bruce, 3, Victoria-street, Westminster, on payment of 5s. per sheet.

JULY 24.—**Manchester.**—COVERING OVER RIVER.—Lancashire and Yorkshire Railway Directors invite tenders for covering over of the River Irk, near Victoria Station, Manchester. Plans can be seen, and form of tender and specification obtained, on application at the Engineer's Office, Hunt's Bank, Manchester. Tenders, endorsed "Tender for Covering Over River Irk, Victoria Station, Manchester," to be in the hands of Mr. R. C. Irwin, Secretary, Hunt's Bank, Manchester, not later than 10 o'clock a.m., July 24.

JULY 24.—**Orrell Park.**—A HALTE.—Lancashire and Yorkshire Railway Directors invite tenders for the construction of a halte at Orrell Park, between Walton Junction and Aintree. Plans can be seen, and form of tender and specification obtained, on application at the Engineer's Office, Hunt's Bank, Manchester. Tenders, endorsed "Tender for Halte at Orrell Park," to be in the hands of Mr. R. C. Irwin, Secretary, Hunt's Bank, Manchester, not later than 10 o'clock a.m., July 24.

JULY 25.—**Dublin.**—REPAIR OF PIER.—Dublin C.C. invite tenders for the repairing of the south pier of the harbour, Lambay Island, in accordance with the County Surveyor's specification, which may be seen in office of Mr. R. T. Blackburne, Secretary, County Dublin C.C., 11, Rutland-square, Dublin, between 11 a.m. and 3 p.m. on any day (except Saturday), when it may be seen up to 1 p.m. Tenders, endorsed "Lambay Harbour," are to be lodged with Secretary not later than 4 p.m. on July 25.

JULY 25.—**Longford.**—WATER MAINS.—Sevenoaks R.D.C. invite tenders for providing and laying water mains at Longford, near Sevenoaks, as follows:—(1) 281 ft. of 2-in. cast-iron water main; (2) 1,308 ft. of 1-in. galvanised iron water pipes. Plans and specification may be seen at the office of Mr. A. Fowler, Surveyor to the Council, Longford, Sevenoaks. Separate tenders, sealed and endorsed outside, must be sent to Mr. George F. Carnell, Clerk of the Council, Sevenoaks, on or before July 25.

JULY 25.—**Manchester.**—PIPE.—Manchester Electricity Committee invite tenders for the supply, delivery, and erection at their Dickinson-street Generating Station of one atmospheric exhaust pipe. Specifications, drawings, and forms of tender may be obtained from Mr. F. E. Hughes, Secretary, Electricity Department, Town Hall, Manchester. Tenders, duly endorsed and addressed to the Chairman of the Electricity Committee, must be delivered to the Town Hall not later than noon on July 25.

JULY 25.—**Middlesbrough.**—CONVENIENCES.—Middlesbrough Sanitary Committee invite tenders for the erection and completion of a semi-underground convenience in Newport-road, at Boundary-road. Drawings and specification can be seen, and bills of quantities obtained, at the office of Mr. Frank Baker, C.E., F.G.S., Borough Engineer, Municipal-buildings, Middlesbrough, on payment of 10s. 6d. Sealed tenders, upon the form supplied, must be sent in not later than 10 a.m. on July 25, endorsed "Tender for Convenience, Newport-road," and addressed to Mr. Alfred Sockett, Town Clerk.

JULY 25.—**Norwich.**—BOILERS.—The Guardians of the Poor of the Norwich Incorporation invite tenders for two new Lancashire boilers and fittings, and a Green's economiser (160 tubes), to be delivered, on seatings provided, at Norwich Workhouse. Plans can be seen, and copies of specification obtained, on payment of 1*l.* 1s., at the offices of Messrs. Morgan & Buckingham, architects and surveyors, 3, Redwell-street, Norwich. Tenders to include credit for purchase and removal of two existing boilers. Sealed tenders, endorsed "Tender for Boilers, etc.," to be delivered to Mr. Henry Stone, Clerk to the Guardians, Guardians' Office, St. Andrew-street, Norwich, not later than 3 o'clock on July 25.

JULY 25.—**Sutton.**—ELECTRIC LIGHT.—The Metropolitan Asylums Board invite tenders for installation of electric lighting at the Downs school, Banstead-road, Sutton, Surrey, in accordance with drawings and specification prepared by Mr. W. T. Hatch, M.Inst.C.E., M.I.Mech.E., Engineer-in-Chief. Drawings, specification, conditions of contract, and form of tender, may be inspected at the office of the Board, Embankment, E.C., and can then be obtained upon payment of a deposit of 2*l.* Tenders, addressed as noted on the form, must be delivered at the office of the Board not later than 10 a.m. on July 25.

JULY 26.—**Bradford-on-Avon.**—SEWAGE DISTRIBUTORS.—Bradford-on-Avon U.D.C. invite tenders for the supply and fixing of sixteen 38-ft. diameter revolving sewage distributors at their Sewage Disposal Works, Bradford-on-Avon; also for the supply of valves and fittings. A copy of the conditions and specification and forms of tender can be obtained of the Council's Surveyor, Mr. A. S. Wootton, Town Hall Chambers, Bradford-on-Avon, upon payment of a deposit of 1*l.* 1s. Sealed tenders, upon prescribed forms, marked outside "Tender for Sewage Distributors," or "Tender for Valves," etc., as the case may be, must be delivered or sent to Mr. E. Pinckney, J.P., South Wraxall, Bradford-on-Avon, not later than mid-day, July 26.

JULY 26.—**Dublin.**—STEEL RAILS, ETC.—Great Southern and Western Railway (Ireland) Directors invite tenders for the supply of:—5,500 tons steel rails, 400 tons steel soleplates, 150 tons steel fishplates, in accordance with the specifications, which can be obtained on application to the Company's Engineer, Inchicore, Dublin. The specifications for the rails (2), fishplates (2), and soleplates are upon separate forms, and a charge of 5s. (not returnable) will be made for each specification. Tenders, which must be made on the form attached to the specification, must be delivered at Kingsbridge Terminus, Dublin, addressed to Mr. Francis B. Ormsby, Secretary, and endorsed "Tender for Rails, etc.," before 10 a.m. on July 26.

JULY 26.—**York.**—DESTRUCTOR BUILDINGS.—York Corporation invite tenders for extending the destructor buildings, Foss Islands Depôt. Specification and bill of quantities may be obtained at office of Mr. A. Creer, Architect, Guildhall, York, on deposit of 1*l.* 1s. Tenders, endorsed "Destructor Buildings," to be delivered not later than noon on July 26.

JULY 28.—**Bandon.**—WATERWORKS.—Bandon (Ireland) R.D.C. invite tenders for the laying of additional water mains in the town of Bandon. Plan and specification may be seen and inspected at the Council Room at the Workhouse. Tenders, containing the names of two solvent sureties willing to become bound with the contractor in a bond for double the amount of the contract, for the due performance of the work, to be lodged with Mr. A. Haynes, Clerk of District Council, Council Room, Workhouse, before 12 o'clock noon on July 28.

JULY 30.—**Ballinasloe.**—ROOF FRAMES.—Supplying and erecting five iron and steel roof frames for a span of 30 ft. in the clear, according to plans and specification, prepared by Mr. W. H. Kempster, C.E., which plans may be seen at the District Asylum Office, between the hours of 10 a.m. and 4 p.m., from July 16 to July 28. Tenders, marked "Tender for Roof Frames," to be sent to the Resident Medical Superintendent on or before 12 o'clock noon on July 30.

JULY 30.—**Beckenham.**—DUST DESTRUCTOR.—Beckenham U.D.C. invite tenders for the extension of their dust destructor, and also for repairs and alterations to the existing cells. Particulars and forms of tender may be obtained on application to Mr. John A. Angell, Surveyor, on the production of a receipt from the collector for a deposit of 2*l*. Tenders, duly sealed, and endorsed "Tenders for Dust Destructors," to reach Mr. F. Stevens, Clerk to the Council, not later than 4 p.m., July 30.

JULY 30.—**Durban, Natal.**—STEEL TRAMWAY POLES.—The Corporation of Durban, Natal, invite tenders for the supply and delivery, "free on board," of 166 welded steel tube tramway poles, 38 ft. long, in one length, with cast-iron finials, all of British manufacture. Particulars may be obtained on application to Messrs. Webster, Steel, and Co., agents to the Durban Corporation, 5, East India-avenue, Leadenhall-street, London, E.C., to whom tenders (sealed and endorsed) must be delivered on or before July 30.

JULY 30.—**Reading.**—IRONWORK.—The Corporation of Reading invite tenders for the manufacture, supply, and erection on site complete of ironwork and fittings in connexion with a cattle auction with sale ring—two ranges of sheep pens and two ranges of pig pens at the Corporation Cattle Market, Great Knollys-street, Reading. Drawings and specification may be inspected, and form of tender, etc., obtained at the Offices of the Borough Engineer and Surveyor, Town Hall, Reading. Sealed tenders, in the printed addressed envelopes provided for the purpose, must be delivered to Mr. John Bowen, Assoc.M.Inst.C.E., Borough Engineer and Surveyor, Town Hall, not later than 12 o'clock noon on July 30.

JULY 30.—**Rhymney.**—WATER MAINS, ETC.—Rhymney U.D.C. invite tenders for the supply of cast-iron water mains, valves, hydrants, etc. Specification, bill of quantities, and form of tender obtained of Mr. W. Lloyd Marks, Surveyor, 61, High-street, Rhymney, on payment of 1*l*. 1s. Sealed tenders, endorsed "Water Mains," to be sent to Mr. LL. Reynolds, Clerk to the Council, Milbourne-chambers, Merthyr Tydfil, not later than 12 noon on July 30.

JULY 31.—**Bangor.**—PLANT.—The U.D.C. of Bangor, Co. Down, invite tenders for the supply and erecting complete of a sulphate of ammonia plant. Full particulars can be had at the gasworks from the Manager, Mr. B. Mitchell. Sealed tenders, endorsed "Sulphate Plant," must be delivered at office of Mr. James Milliken, Town Clerk, Town Hall, Bangor, Co. Down, not later than 12 o'clock noon on July 31.

JULY 31.—**London.**—FILTER BEDS.—Metropolitan Water Board invite tenders for the construction of filter beds at Barn Elms, in the Western District. Forms of tender and contract, with specification, may be obtained on application to the District Engineer, Commercial-road, Pimlico, on production of an official receipt for the sum of 5*l*., which sum must be deposited with the Comptroller, at the Board's Central Offices, Savoy-court, Strand, W.C. Tenders, enclosed in sealed envelopes, addressed to the Clerk of the Board, Metropolitan Water Board, Savoy-court, Strand, W.C., and endorsed "Tender for Filter Beds, Western District," must be delivered at the offices of the Board not later than 10 a.m. on July 31.

JULY 31.—**Shanghai.**—PLANT.—Messrs. Preece & Cardew are authorised by the Municipal Council of Shanghai to receive tenders for the supply and delivery, c.i.f. Shanghai, of the following plant:—(*a*) Two 600-kilowatt steam turbo-dynamos, or, as an alternative, two 600-kilowatt steam dynamos, together with condensing plant, certain pipes and valves, motor generator, switchboard, etc.; (*b*) two water-tube boilers, with feed-water heaters, superheater, and chain grate stokers, feed pump, pipes, valves, etc. Specifications, general conditions, and forms of tender can be obtained from Messrs. Preece & Cardew, 8, Queen Anne's-gate, Westminster, S.W., on payment of a deposit of 2*l*. for each section. Extra copies of the specification and general conditions for each section can be obtained on payment of 5s. each (non-returnable). Sealed tenders, endorsed "Shanghai Electricity Supply," are to be addressed to Messrs. Preece & Cardew, 8, Queen Anne's-gate, Westminster, S.W., and delivered before 12 o'clock noon on July 31.

AUGUST 2.—**Aberdeen.**—BRIDGE WIDENING.—Aberdeen Town Council invite tenders for the widening of Union Bridge by the addition on each side of a steel arch rib, and by extending the existing masonry abutments, and all other works in connexion therewith. Drawings may be seen, and specification, schedule of quantities, and form of tender obtained, from Mr. W. Dyack, M.Inst.C.E., Burgh Surveyor, Aberdeen, on deposit of the sum of 5*l*. Sealed tenders, addressed to the Town Council of Aberdeen, and endorsed "Tender for Aberdeen City Improvements—Union Bridge Widening," to be lodged with the Surveyor not later than 11 o'clock a.m. on August 2.

AUGUST 3.—**Goole.**—RENEWAL OF BRIDGE SUPERSTRUCTURE.—North-Eastern Railway Directors invite tenders for the renewal of the superstructure of the bridge carrying the Hull and Doncaster Railway over the Lancashire and Yorkshire Railway, near Goole. Plans may be seen, and specification, detailed quantities, and form of tender obtained, on personal application at the office of Mr. W. J. Cudworth, the Company's Engineer, at York. Sealed tenders, marked "Tender for the Renewal of Bridge, Goole," must be sent to the Secretary at York not later than August 3.

AUGUST 5.—**Edmonton, Alta, Canada.**—REFUSE DESTRUCTORS.—Tenders are invited for destructors for the City Sanitary Department. Present population approximately 12,000. Propositions and plans to be fully descriptive of capacity, etc., with arrangements for readily extending the plant. Tenders and plans, addressed "City Commissioners, Edmonton," to be delivered not later than August 5. Mr. Geo. J. Kinnaird, Secretary-Treasurer, Edmonton.

✱ AUGUST 7.—**Cradley.**—CORRUGATED IRON GOODS SHED, ETC.—Tenders are required by the Great Western Railway Company for a corrugated iron goods shed, offices, etc., at Cradley. Plans and specifications may be seen, and forms of tender and bills of quantities obtained, at the office of the engineer at Wolverhampton Station, between 10 a.m. and 4 p.m. Tenders, marked outside "Tenders for Goods Shed, etc., Cradley," to be in by August 7.

AUGUST 9.—**Painswick.**—RESERVOIR.—Stroud Water Company Directors invite tenders for supplying materials and constructing a reservoir at Painswick. Also for the providing and laying of about 9,163 yds. of 6-in., 4-in., C.I. mains, and 1¼-in., 1-in., and ¾-in. galvanised piping, together with the necessary bends, T's, valves, etc., from Cashes Green to Painswick, Gloucestershire, in accordance with plans and specifications, which may be inspected at the company's office, 13, Kendrick-street, Stroud, on Mondays and Fridays. Tenders, to be endorsed "Extension to Painswick," are to be sent to the Secretary of the Company, 181, Queen Victoria-street, London, on or before August 9.

MISCELLANEOUS.

JULY 23.—**Leeds.**—GAS OIL.—Leeds Corporation Gas Committee invite tenders for the supply of 2,000 tons of gas oil for the manufacture of carburetted water gas, for a period of one year, commencing on September 1 next. Specification and conditions of tender may be obtained on application to Mr. R. H. Townsley, General Manager, Gas Offices, East Parade, Leeds. Tenders and samples, addressed to the Town Clerk, and endorsed "Gas Oil," must be delivered at the Town Hall, Leeds, on or before July 23.

JULY 23.—**Pontypridd.**—WAGGONS.—Pontypridd U.D.C. invite tenders for the supply, complete, of five four-wheeled tip waggons suitable for scavenging purposes. Specification can be seen on application at the office of the Engineer and Surveyor, Mr. P. R. A. Willoughby, A.M.Inst.C.E. Tenders, sealed, and endorsed "Tenders for Waggons," must be received by Mr. J. Colenso Jones, Clerk to the Council, Municipal-buildings, Pontypridd, not later than July 23.

JULY 23.—**Waltham Cross.**—STEAM ROLLER.—Waltham Holy Cross U.D.C. invite tenders for the general overhauling and repairing of their steam roller. The roller may be viewed, and the specifications examined, on application to Mr. W. T. Streather, Assoc.M.Inst.C.E., Town Hall, Waltham Abbey. Tenders, in envelopes supplied by the Engineer, to reach the office of Mr. F. C. E. Jessopp, Clerk to the Council, by 12 noon on July 23.

JULY 25.—**Heanor.**—ROLLER.—Heanor U.D.C. invite tenders for a compound 10-ton steam road-roller, to be delivered on or before September 29 next. Tenders, with drawings and specifications attached, endorsed "Tender for Steam Roller," to be sent to Mr. John Holbrook, Surveyor, Town Hall, Heanor, Derbyshire, by 6 o'clock on July 25.

JULY 25.—**Ticehurst.**—ROAD ROLLING.—Ticehurst R.D.C. invite tenders for steam rolling in their district as from the first week in November, 1906. The contractors will be required to supply one or more rollers, with driver and mate to each, scarifiers, sleeping vans, water carts, with horse and man to each, and also necessary appliances. The work to be undertaken either by the piece or by day work as the Council may determine. Forms of tender may be obtained from Mr. W. N. Wood, Surveyor, Ticehurst, on a stamped addressed foolscap envelope being forwarded. Tenders, sealed and endorsed "Steam Rolling," must be sent to reach Mr. J. C. Lane Andrews, Clerk to the Council, Wadhurst, Sussex, not later than July 25.

JULY 25.—**Tunbridge Wells.**—PULLING DOWN, ETC.—The Ground Committee of the Tunbridge Wells and South-Eastern Counties' Agricultural Society invites tenders for pulling down and storing the timber used in the Society's show, on July 26 and 27, and erecting same in 1907. Forms of tender may be obtained upon application to Mr. Charles J. Parris, surveyor, at 67, High-street, Tunbridge Wells. Tenders to be sent in to the Surveyor, marked "Show Tender," on or before 12 o'clock on July 25.

JULY 28.—**Blackley.**—TERRA-COTTA.—Manchester Education Committee invite tenders for the supply of terra-cotta for the Domett-street Municipal school, Blackley, Manchester. Plans may be seen, and a copy of the bill of quantities (including specification) may be obtained at the offices in Deansgate, Manchester, on a deposit of 1*l*. 1s. Tenders, on the forms and in the envelopes provided, must be delivered at the Deansgate offices of the Education Committee not later than July 28.

JULY 31.—**Beaconsfield.**—CARTING, ETC.—The U.D.C. of Beaconsfield invite separate tenders as follows:—(1) For the supply of a suitable horse for carting materials on the highways as required in the district at per day of ten hours; (2) for the carting of ballast from Long Bottom (at per cubic yard) and depositing the same on the following roads—(*a*) Penn-road (including Ledboro'-lane), (*b*) Amersham-road (including Seer Green-road), (*c*) Windsor-road, (*d*) Burnham-road and Hedgerley-road. Further particulars can be obtained of the Surveyor, Mr. H. Watson, Beaconsfield. Separate tenders, under seal, and endorsed "Tender for Horse Hire" and "Tender for Carting" respectively, must be sent in to Mr. C. H. Charsley, Clerk, Beaconsfield, not later than 4 o'clock p.m., July 31.

JULY 31.—**London.**—ROPES, ETC.—Bombay, Baroda, and Central India Railway Company invite, up to noon on July 31, tenders for the supply of the following stores, viz.:—Class B, Manilla lashing ropes; Class C, red and white lead. Tenders must be made on forms, copies of which, with specifications, can be obtained at offices of Mr. W. V. Constable, Secretary, Gloucester House, 2, 3, and 4, Bishopsgate-street Without, London, E.C., on payment, as follows:—For Class B, 10s. 6d. each; and for Class C, 5s. each (which will not be returned).

✱ AUGUST 1.—**New Cross.**—FIRE GUARDS.—Tenders are invited for the supply and fixing of about fifty fire guards at the South-Eastern Hospital, New Cross, S.E., in accordance with drawings, etc., by the Engineer-in-Chief. Drawings, specifications, etc., may be inspected at the Metropolitan Asylums Board Offices, Embankment, E.C., on and after Monday, July 23, and obtained then on deposit of 1*l*. Tenders, addressed as noted on form, to be delivered at above offices not later than 10 a.m. on Wednesday, August 1.

AUGUST 11.—**Atcham.**—ROLLER.—Atcham R.D.C. invite tenders for the hire of a 10-ton steam roller, etc., from October 1, 1906, to November 30, 1906, and from March 1, 1907, to May 31, 1907, are invited. Particulars may be had on application to Mr. Mr. Joseph Everest, Clerk to the Council, St. John's Hill, Shrewsbury; or the Surveyor, Mr. T. Fortune, of Pontesbury. Also for a man and horse for the Council's water cart to work with the steam roller. Sealed tenders must be sent to Clerk not later than August 11, marked on outside "Steam Roller" or "Man and Horse," as the case may be.

NO DATE.—**Hereford.**—CLEANING OUT BROOK.—Persons desirous of undertaking the cleaning out of about five miles, are desired to send their names to Messrs. H. Haywood & Son, Hereford.

PAINTING, etc.

JULY 23.—**Ashton-under-Lyne.**—PAINTING.—The Corporation of Ashton-under-Lyne invite tenders separately for painting the whole of the woodwork and ironwork on the exterior of the Municipal baths and of the town hall. Specifications and tender forms, and any information may be obtained at the office of the Borough Surveyor. Tenders to be enclosed in official envelopes, sealed with wax, and endorsed "Tender for Painting Baths," and "Tender for Painting Town Hall," respectively, and they must be delivered at the office of Mr. John Neal, Borough Comptroller, Town Hall, not later than 12 o'clock noon on July 23.

JULY 23.—**Huddersfield.**—PAINTING.—Huddersfield Education Committee invite tenders for painting and other work at various schools. General specification and conditions may be seen, and forms of tender and short specification for each school obtained, on application at the offices of Mr. K. F. Campbell, M.Inst.C.E., Borough Engineer. Sealed tenders, endorsed "Tender for Painting Moldgreen School," or as the case may be, signed in the handwriting of the tenderer or his agent, and addressed "Town Clerk, Town Hall, Huddersfield," must reach him not later than 10 a.m. on July 23.

JULY 23.—**Knockninny.**—CEILING, ETC.—For ceiling, etc., Knockninny Catholic Church, according to plan and specification to be seen at residence of Mr. John Shannon, P.P., Derrylin, on or before July 23.

JULY 24.—**Birkenhead.**—PAINTING.—The Corporation of Birkenhead invite tenders for painting the Woodside Ferry Buildings and Approaches. Further information, specifications, and forms of tender may be obtained on application at the office of the Ferries Manager, Woodside Ferry, Birkenhead. Tenders (which must be on the printed form supplied), sealed and endorsed "Tender for Painting Ferry Buildings," must be sent in to Mr. Alfred Gill, Town Clerk, Town Hall, Birkenhead, not later than 5 o'clock in the afternoon of July 24.

JULY 24.—**Great Yarmouth.**—PAINTING, ETC.—Great Yarmouth Education Committee invite tenders for washing and colouring the inside walls of the following schools:—St. James's, St. John's, St. Peter's, St. Mary's (Regent-road), Hospital, and the "Daniel Tomkins" (late British). Tenders are also invited for painting the outside wood and iron work of Church-road (Gorleston) and Cobholm Island Schools. Specifications of the work to be done, and forms of tender, may be obtained at the Office of the Borough Surveyor, Town Hall, Great Yarmouth. Separate (endorsed) tenders to be delivered at the office of the Committee, 28, South Quay, Great Yarmouth, by noon on July 24.

✱ JULY 25.—**Hammersmith.**—PAINTING.—Tenders are invited for painting portion of steel work of Addison-gardens Bridge. Plans and specifications may be seen, and forms of tender obtained, on application to the Borough Surveyor. Tenders, endorsed "Tender for Painting Bridge," must be delivered to the Town Clerk, Town Hall, Broadway, Hammersmith, not later than 6 p.m. on July 25.

JULY 27.—**Hull.**—PAINTING.—Hull Corporation invite tenders for certain painting required at Drypool Bridge and North Bridge. Forms of tender and other particulars may be obtained at the City Engineer's office. Tenders, endorsed "Tender for Painting Bridges," are to be addressed to the Chairman of the Bridges Committee, and delivered at the Town Clerk's office before 10 a.m. on July 27.

JULY 27.—**Salford.**—PAINTING, ETC.—Salford Guardians invite tenders for whitewashing, painting, and decorating required at the following: Union Workhouse, Eccles New-road, Salford; and Union Infirmary, Hope, near Eccles. Specifications can be obtained at offices of Mr. F. Townson, Clerk to the Guardians, Union Offices, Eccles New-road, Salford. Tenders must be delivered, in sealed envelopes, endorsed "Tender for Painting, etc.," not later than 10 a.m. on July 27.

JULY 30.—**Caerau.**—PAINTING.—Llandaff and Dinas-Powis R.D.C. invite tenders for painting and glazing required at their Infectious Diseases Hospital now in course of erection at Caerau, near Cardiff, in accordance with specification and bill of quantities which may be obtained on application to Mr. J. H. James, 18, Quay-street, Cardiff. Tenders, sealed and endorsed, to be sent to Mr. M. Warren, Clerk, Park House, Cardiff, not later than 12 noon on July 30.

JULY 30.—**Warrington.**—PAINTING.—Warrington Electricity and Tramways Committee invite tenders for:—(1) Painting tramway poles and brackets; (2) painting electric light standards. Particulars can be obtained on application to Mr. F. V. L. Mathias, Borough Electrical and Tramways Engineer, Howley, Warrington. Tenders must be sealed with wax, endorsed "Tender for Painting Poles," and delivered not later than 12 o'clock noon on July 30, addressed to the Chairman of the Electricity and Tramways Committee, Town Hall, Warrington.

No DATE.—**Golborne.**—PAINTING.—Painting (outside) twenty-one cottages, three dwelling-houses, and one shop, for Messrs. Halliday & Constantine, Ltd., Upper Mills, Golborne.

No DATE.—**Newhey.**—PAINTING.—Outside painting (three coats) fourteen houses belonging to the Newhey Humane Sick and Burial Society. Particulars from Mr. J. Milnes, 123, Huddersfield-road, Newhey.

No DATE.—**Whittington.**—PAINTING.—Derbyshire Education Committee invite tenders for painting and colouring, inside only, New Whittington and Whittington Moor Schools. To be done during August. Apply for specification, Mr. J. J. Creed, Correspondent, Old Whittington, Chesterfield.

ROADS, SANITARY, AND WATER WORKS.

JULY 23.—**Altrincham.**—STREET WORKS.—Altrincham U.D.C. Highways Committee invite tenders for making up a portion of Mayors-road. Plans and specification may be seen, and quantities and forms of tender obtained, on application to the surveyor. Tenders to be sent in, endorsed "Mayors-road," and addressed to the Chairman of the Highways Committee, Town Hall, Altrincham, not later than 12 o'clock on July 23.

JULY 23.—**Finchley.**—SEWER.—The U.D.C. of Finchley invite tenders for the construction of a 12-in. and 9-in. surface-water sewer and appurtenant works in Hendon-lane and Waverley-grove of about 520 yds. in length. The proposed works to be constructed in accordance with drawings, specification, etc., which may be inspected at the offices of the Engineer and Surveyor to the Council, at Church End, Finchley. Copies of the specification and schedules, together with form of tender, may be obtained from the Engineer on application, accompanied with a deposit of 2*l*. Sealed tenders, endorsed "Hendon-lane, etc., Sewer," and addressed to Mr. E. H. Lister, Clerk to the Council, Council Offices, Finchley, London, N., to be sent in by not later than 5 o'clock on July 23.

JULY 23.—**Hasland.**—SEWERAGE WORKS.—Chesterfield R.D.C. invite tenders for the construction of 15-in., 12-in., 9-in., and 6-in. stoneware sewers, and 12-in. cast-iron sewer, together with 15-in. and 9-in. surface-water drains, with the necessary manholes, flushing chambers, ventilating columns, etc. Drawings may be seen, and specifications, bills of quantities, and forms of tender obtained, on a deposit of 3*l*. 3s., at the office of Mr. Edgar Lines, C.E., Engineer, Union Offices, Chesterfield. Sealed tenders, endorsed "Hasland Sewerage," to be delivered at the office of Mr. R. F. Hartwright, Clerk to the Council, Union Offices, Chesterfield, not later than 12 o'clock noon on July 23.

JULY 23.—**High Beech.**—MAKING UP ROAD.—Waltham Holy Cross U.D.C. invite amended tenders for the making up of Fairmead-road, High Beech. Plans and specifications may be seen on application to Mr. W. T. Streather, A.M.Inst.C.E., Town Hall, Waltham Abbey. Tenders, in envelopes supplied by Engineer, to reach the office of Mr. F. C. E. Jessopp Clerk to the Council, by 12 noon on July 23.

JULY 23.—**Selby.**—ROAD.—The construction of a road from East Common-lane, Selby, to Messrs. Cochrane & Sons' Shipyard. Form of tender and schedule can be obtained on application to Messrs. Cochrane & Sons, Shipbuilders, Selby. Tenders to be received by Messrs. Cochrane & Sons, Ouse Shipbuilding Yard, Selby, not later than noon on July 23.

JULY 24.—**Ashton-under-Lyne.**—WATER CARRIAGE CONVERSIONS.—Ashton-under-Lyne Sanitary Committee invite tenders for work in converting the closets at property situate Hague-street, Swindell-street, Botany-lane, Holden-street, Queen-street, and Minto-street. Plans and specifications may be seen, and bills of quantities obtained, from Joseph Lowe, Sanitary Surveyor, Health Department, Town Hall Chambers. Sealed tenders, endorsed "Conversion," to be addressed to, and delivered at the office of, Mr. John Neal, Borough Comptroller, Town Hall, Ashton-under-Lyne, not later than 12 o'clock noon, July 24.

JULY 24.—**Islington.**—ASPHALT AND WOOD PAVING.—Islington Borough Council invite tenders for paving the carriageway of Strond Green-road, and of Crouch Hill from the north-west side of Hanley-road to the north-west side of Trinder-road, part with compressed asphalt and part with creosoted yellow deal blocks; and for paving the carriageway at the intersection of Stapleton Hall-road, Hankey-road, Stroud Green-road, and Crouch Hill, with compressed asphalt. Conditions and specification may be seen, and form of tender and bill of quantities obtained, upon application to the Borough Engineer, Mr. J. Patten Barber, at the Town Hall, Upper-street, N., and payment of 2*l*. 2s. Sealed tenders, endorsed "Tender for Asphalt and Wood Paving," must be received by Mr. Wm. F. Dewey, Town Clerk, Town Hall, Upper-street, Islington, N., not later than 4 p.m. on July 24.

JULY 24.—**Tynemouth.**—PAVING, ETC.—Tynemouth Corporation invite tenders for executing the following street works:—(1) Paving, etc., in George-street East and in lane north of George-street East, North Shields; (2) paving, etc., in lane south of Shakespeare-street, North Shields. Plans and specifications may be seen at the office of Mr. John P. Smillie, Borough Surveyor, to whom sealed and endorsed tenders are to be sent not later than 10 a.m. on July 24.

★ JULY 24.—**Willesden.**—ROAD-MAKING, ETC.—The Willesden District Council invite tenders for certain road-making and paving works. Plans and specifications may be seen, and all further particulars obtained, on and after July 16, upon application to Mr. O. Claude Robson, Council's Engineer, Public Offices, Dyne-road, Kilburn, N.W. Tenders, endorsed "Private Streets," to be delivered at the offices of the Council before 4 p.m., July 24. A 10*l*. note to be deposited with each tender.

JULY 25.—**Armagh.**—DRAINAGE.—A new system of drainage in connexion with the main building of Armagh Asylum. Plans and specifications may be seen at the asylum, or at office of Mr. R. H. Dorman, County Surveyor, the Courthouse, Armagh. Sealed tenders to be delivered not later than July 25.

JULY 26.—**Hackney.**—ROAD-MAKING, ETC.—Hackney Borough Council invite tenders for works of kerbing, channelling, paving, making up, etc., at Mount Pleasant-lane, Upper Clapton, between Upper Clapton-road and Mount Pleasant-hill. The general conditions of contract and the specification and plan and sections may be inspected, and copies of the bill of quantities and form of tender obtained, on application to Mr. Norman Scorgie, M.Inst.C.E., Borough Engineer and Surveyor, and on payment of the sum of 1*l*. 1s. Tenders, sealed and endorsed "Mount Pleasant-lane," must be delivered at the Town Hall, Hackney, N.E., not later than 5 p.m. on July 26.

JULY 26.—**Harrogate.**—STREET WORKS.—Harrogate Corporation invite tenders for private street works required in back roads off Studley-road, and back road on west side of Harrogate Hotel, Starbeck. Tenders must be submitted not later than 9 a.m. on July 26. Mr. F. Bagshaw, Borough Engineer and Surveyor.

JULY 26.—**Wallsend.**—STREET WORKS.—Wallsend Corporation invite tenders for the macadamising, kerbing, cementing, etc., certain roads. Plans and specifications may be seen, and forms of tender obtained, on application to Mr. George Hollings, Borough Surveyor, Corporation Offices, Wallsend. Tenders, sealed and endorsed "Tender for New Streets, etc.," to be received by Mr. W. V. Mulcaster, Town Clerk of Wallsend, 28, Sandhill, Newcastle-on-Tyne, on or before noon on July 26.

JULY 27.—**Bucklow.**—SEWERAGE WORKS.—Bucklow R.D.C. invite tenders for the construction of the following works of sewerage within the township of Dunham Massey:—1,170 lin. yds. or thereabouts of 18-in. diameter stoneware pipe and concrete sewer, between Lowerhouses and Broadheath; 80 lin. yds. or thereabouts of 15-in. diameter stoneware pipe and concrete sewer; and 36 lin. yds. or thereabouts of 15-in. diameter cast-iron pipe and concrete sewer under the railway at the cattle bridge, 500 yds. or thereabouts west of the Broadheath Station on the L. and N.W. Railway. Plans, etc., seen, and bill of quantities, with form of tender and any other information obtained, on application to Mr. J. P. Wilkinson, M.Inst.C.E. at his offices, 301, Cathedral-street, Manchester, and on deposit of the sum of 2*l*. 2s. Sealed tenders, endorsed "Dunham Massey Sewerage, Contract No. 4," must be addressed and delivered to Mr. George Leigh, Clerk to the R.D.C., Union Offices, Knutsford, Cheshire, not later than 10 o'clock a.m. on July 27.

JULY 28.—**Lye and Wollescote.**—GRANITE SETT PAVING.—Worcestershire C.C. Highways and Bridges Committee invite tenders for about 3,000 lin. yds. of Rowley granite kerbing, and 10,300 super. yds. of granite sett paving, to be laid on the Stourbridge and Hales Owen main road, situate in the urban district of Lye and Wollescote. Drawings may be inspected, and specification, bill of quantities, and form of tender obtained, on application, and payment of a fee of 2*l*. 2s., to Mr. J. H. Garrett, County Road Surveyor, Shire Hall, Worcester. Sealed tenders, marked "Tender for Granite Sett Paving," must be delivered at office of Surveyor not later than 10 o'clock on July 28.

JULY 30.—**Middleton.**—SEWERS.—Chadderton U.D.C. invite tenders for the construction of eathenware and cast-iron pipe sewers, etc., for the sewerage of the Middleton Junction District. Drawings and specificatjons may be seen, and quantities, form of tender, and all other particulars obtained, on application at the offices of Messrs. James Diggle & Son, civil engineers, Hind Hill-street, Heywood; and 14, Victoria-street, Westminster, S.W., on payment of a sum of 3*l*. Tenders, endorsed "Tenders for Middleton Junction Sewerage, Contract No. 14," are to be sent to Mr. Henry Hoyle, Clerk to the Council, Town Hall, Chadderton, not later than July 30.

JULY 31.—**Lydstep Haven.**—CARRIAGE DRIVE.—A new carriage drive (1,273 yds. long) at Lydstep Haven, Pembrokeshire, for Mr. John Wynford Philipps, M.P. Sealed tenders, endorsed "Lydstep Drive," to be sent in on or before July 31 to Mr. Hugh Thomas, surveyor, 9, Victoria-place, Haverfordwest, from whom plans, specifications, and full particulars may be obtained.

AUGUST 1.—**Erdington.**—ROAD.—For sewering and making a new road (about 445 yds. lin.) at Erdington, near Birmingham. Plans and specification may be inspected, and bills of quantities and form of tender obtained, on depositing the sum of two pounds (2*l*.) with Messrs. Wm. Parrott & Antrobus, surveyors, 19, Colmore-row, Birmingham. Sealed tenders, endorsed "Tender for New Road at Erdington," to be sent not later than August 1.

AUGUST 1.—**Sunderland.**—PAVING.—The Corporation of Sunderland invite tenders for the work to be done in levelling, paving, channelling, kerbing, etc., of certain private streets (V. loan). Drawings and specifications may be seen, and form of tender and quantities obtained, at the Borough Surveyor's Office, Town Hall, on payment of 1*l*. 1s. Sealed tenders, addressed "To the Chairman of the Highways Committee," and endorsed "Tender for Paving, etc. (V. loan)," must be delivered at the Town Clerk's Office, Town Hall, before 12 o'clock noon on August 1.

AUGUST 1.—**Widnes.**—STREET WORKS.—Widnes Corporation invite tenders for certain private improvement works in each of six streets and nine passages, situate at Simms Cross. Plans, sections, and specifications may be seen, and forms of tender with bills of quantities obtained, at the office of Mr. John S. Sinclair, A.M.Inst.C.E., Borough Surveyor, Town Hall, Widnes, upon deposit of 2*l*. 2s. Tenders, sealed and endorsed "Tender for Private Improvement Works" to be sent, on forms supplied, to Mr. H. S. Oppenheim, Town Clerk, Town Clerk's Office, Town Hall, Widnes, on or before August 1.

AUGUST 6.—**Carlisle.**—URINAL.—Carlisle Burial Joint Committee invite tenders for an iron urinal at Upperby Cemetery. Specification may be seen at the Clerk's Office, 27, Lowther-street, Carlisle. Tenders to be sent to the Clerk not later than August 6.

AUGUST 8.—**London.**—ROAD-MAKING.—Tenders are required for formation of new road at Muswell Hill. Plans and sections seen, and specifications obtained, upon personal application to Messrs. Vigers & Co., 8, Frederick's-place, Old Jewry, E.C., and tenders delivered to Mr. C. J. Hayter, 84, Temple-chambers, Temple-avenue, E.C., before 2 p.m., August 8.

AUGUST 8.—**Portsmouth.**—SEWERS, ETC.—The Corporation invite tenders for the construction of sewers, manholes, pumping station, attendant's cottage, and all accessories, in Copner-road, together with Crossley's gas engines and centrifugal pumps. On payment of the sum of 5*l*., a lithographed copy of the specification, general conditions, and bill of quantities, with form of tender, can be obtained on application to Mr. Alexander Hellard, Town Clerk, Town Hall, Portsmouth, and any further particulars can be obtained at the Borough Engineer's Offices, at the Town Hall, Portsmouth. Tenders, marked "Tender for Copnor-road Sewer and Pumping Station," must be filled up, signed, and returned with the bill of quantities duly filled in to the Clerk not later than 10 a.m. on August 8.

STONE, MATERIALS, AND STORES.

JULY 25.—**Horwich.**—MATERIALS.—Horwich U.D.C. invite tenders for the supply of goods and materials required to July 31, 1907, comprising stoneware pipes, 12 in. by 8 in. kerbs, grit rock flags, concrete flags, macadam, limestone shippings, copper lamps, lamp pillars, cast-iron gullies, gulley grates and frames, manhole covers, lamphole covers, cast-iron water pipes, hydrants, sluice valves, hydrant boxes, valve boxes, stop-tap boxes, ferrules and tape, tinned lead piping, pitch, creosote oil, sulphuric acid, scavenging brooms, hammered steel spades, provender, best clover hay, best oat straw, disinfectants, Portland cement, paraffin and other oils, lamp glasses, best washleathers, etc. Form of tender and particulars can be obtained on application to the Surveyor, Council Offices, Horwich. Sealed tenders, endorsed "Tender for ——," to be addressed to Mr. Peter Taberner, Clerk to the U.D.C., Council Offices, Horwich, on or before July 25.

JULY 25.—**Neath.**—GRANITE, ETC.—Neath U.D.C. invite tenders for the supply of about 900 tons of granite (or other approved) metalling, chippings, and siftings, and about 500 tons of limestone, metalling and screenings. Copy of specification may be obtained on application to Mr. D. M. Jenkins, Borough Engineer, Gwyn Hall, Neath, to whom sealed tenders, endorsed "Tender for Road Metalling," are to be delivered on or before July 25.

JULY 25.—**Wanstead.**—STONE.—Wanstead U.D.C invite tenders for 2,000 tons (more or less) of Guernsey granite or Quenast stone, broken to 1½-in. cube, delivered to Snaresbrook Station (G.E. Railway) by such instalments and in such quantities as may be directed in writing from time to time by the Council's Surveyor, beginning September 1 next. Forms of tender can be obtained on application to the Surveyor at the Council Offices. Tenders, sealed and enclosed in the envelopes provided, are to be delivered at the Council Offices not later than July 25.

JULY 27.—**Newport, Mon.**—STORES.—Newport Electricity and Tramways Committee invite tenders for general stores for the ensuing twelve months. Forms of tender may be obtained on application to Mr. H. Collings Bishop, Borough Electrical Engineer and Tramways Manager, Electricity and Tramways Department, Town Hall, Newport, Mon. Tenders, in sealed envelopes, and endorsed on the outside "Tender for Stores," are to be received not later than the first post on July 27.

JULY 28.—**Bedford.**—ROAD MATERIAL.—Bedford R.D.C. invite tenders for the cartage of road material upon the district roads. Tenders on or before July 28, to the District Surveyor, Mr. John T. Sanders, Chellington, Sharnbrook, S.O., Beds.

JULY 30.—**East Dereham.**—GRANITE.—East Dereham U.D.C. invite tenders for 400 tons (more or less) of 2½-in. broken granite and 400 tons (more or less of 1½-in. broken granite, to be delivered free at the East Dereham Station of the Great Eastern Railway Company before the end of November. Forms of tender may be obtained on forwarding a stamped addressed foolscap envelope to the surveyor (Mr. H. G. Himson), Theatre-street, East Dereham. Sealed tenders, endorsed "Tender for Granite," to be sent to Mr. B. H. Vores, Clerk to the Council, not later than July 30.

JULY 31.—**Aldershot.**—MACADAM.—Aldershot U.D.C. invite tenders for the supply (F.O.R. at either of the town stations) of 500 tons 2½ Rhenish Basalt macadam. Forms of tender and all particulars can be obtained upon application at office of Mr. Fred C. Uren, District Surveyor. Tenders, endorsed "Basalt," to be sent to Mr. W. E. Foster, Clerk, on or before July 31.

JULY 31.—**Beaconsfield.**—FLINTS.—The U.D.C. of Beaconsfield invite tenders for the supply of hand-picked flints (200 yds. required, no one tender to be for less than 50 yds.) for use on the Penn-road. The flints to be carted and deposited at the sides of the said Penn-road in quantities and at such times as directed by the Council's Surveyor, Mr. Herbert Watson, Beaconsfield, from whom further particulars can be obtained on application. Tenders, under seal and endorsed as such, must be sent in to Mr. G. H. Charsley, Clerk, Beaconsfield, not later than 4 o'clock p.m. on July 31.

JULY 31.—**Durban, Natal.**—PIPES.—The Corporation of Durban, Natal, invite tenders for the supply and delivery "free on board" of two miles 6-in. diameter, one mile 7-in. diameter, and two miles 8-in. diameter stoneware sewerage pipes. Specifications can be obtained from Mr. W. H. Radford, C.E., Albion-chambers, Nottingham, Consulting and Representative Engineer to the Corporation, on deposit of 1*l*. 1s. Sealed and endorsed tenders must be delivered to Messrs. Webster, Steel, & Co., agents to the Durban Corporation, 5, East India-avenue, Leadenhall-street, London, E.C., on or before July 31.

AUGUST 1.—**Braintree.**—GRANITE.—Braintree U.D.C. invite tenders as under—For the supply and delivery at Braintree Railway Station of 300 tons (more or less) of 2-in. Leicestershire granite, and 300 tons (more or less) of 2-in. Guernsey or Quenast granite; and for the use of a steam roller and scarifier. Forms of tender may be obtained on application to Mr. H. H. Nankivell, Surveyor, Vestry Hall, Braintree. Tenders, endorsed "Tender for Granite," or "Tender for Steam Rolling" (as the case may be), to be delivered to Mr. Herbert J. Cunnington, Clerk, Braintree, on or before August 1.

AUGUST 4.—**Faversham.**—GRANITE.—Faversham Corporation invites tenders for the supply of 970 tons (more or less) of Cornish granite or Rhenish basalt broken to a 2-in. gauge, and of 130 tons (more or less) of clean ½-in. Guernsey granite, Cornish granite, or Rhenish basalt chippings free from dust. The material is to be delivered on to the Town Wharf, Faversham, or into carts or trucks, as may be directed by the Borough Surveyor. The whole of the material is to be delivered in such quantities and at such times not later than December 25, 1906, as may be ordered by the Borough Surveyor. Tenders must be accompanied by a sample of each material tendered for. Tenders, in sealed envelopes, endorsed "Tender for Road Metal," must be sent to Mr. Allan Tassell, Town Clerk, 20, West-street, Faversham, not later than 12 o'clock noon on August 4.

AUGUST 4.—**Saffron Walden.**—GRANITE MACADAM.—Saffron Walden Corporation invite tenders for the supply and delivery at Saffron Walden Railway Station of about 450 tons of granite macadam broken to 1½-in. gauge. To be delivered in such quantities as may be required before March 31, 1907. Samples of granite, with tender, to be delivered to Mr. A. H. Forbes, Borough Surveyor, not later than 12 o'clock on August 4.

Public Appointments.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
•QUANTITY SURVEYOR	Metropolitan Boro., Deptford	Applicants to state terms	July 25
•DRAUGHTSMAN	Straits Settle., P. Wks. Dept.	300l., etc.	July 28

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
•FREEHOLD BUILDING ESTATE, THORNTON HEATH—At the Greyhound Hotel, Croydon	H. J. Bromley	July 24
•FREEHOLD BUILDING SITE, BOW—At the Mart	Mark Lidell & Son	do.
•DEALS, BATTENS, ETC.—Great Hall, Winchester House, Old Broad-street, E.C.	Churchill & Sims	July 25
•BUILDER AND TIMBER MERCHANT'S STOCK, ETC.—New-st. Mews, Kennington Park-rd.	B. Bailey & Co.	do.
•PLANT, MACHINERY, AND STOCK, BATTERSEA—At 103, Lavender-hill, Battersea, S.W.	Fuller, Horsey, Sons, & Cassell	July 26
•TIMBER, WANDSWORTH—At 135, High-street, Wandsworth	H. W. Smith	do.

PATENTS.—*Continued from page 112.*

25,386 of 1905.—W. M. STILL & A. G. ADAMSON: *Steam-heating Systems.*

This invention relates to a steam-heating system, and consists of a steam supply, a radiator, a communication between said steam supply and radiator, a valve in said communication, a device adapted when acted on by the steam to hold said valve closed for a period, a by-pass from the radiator side of said valve to said device and a valvular device controlling said by-pass according to the pressure in the radiator, said device comprising a casing having an inlet passage at its end, and beyond the inlet an enlarged part, a port leading therefrom at a distance from the inlet passage and a loaded valve the body and stem of which are a sliding fit in said inlet passage and enlarged parts respectively.

1,486 of 1906.—H. E. VANSE: *Slats for Fireproof Blinds or Shutters.*

This relates to a fireproof blind having a body portion composed of non-metallic heat-resisting material, and its edges made of separate metallic devices added thereto for joining the slat to other slats.

5,635 of 1906.—G. H. CHUBB, J. E. CHUBB & F. BUTTER: *Adjustable Metal Shelving and Framing for same.*

This relates to an adjustable shelving and framing and consists of fixed vertical standards having holes at suitable distances apart in which are placed bearing strips and of metal sheets or plates which form the shelves, the front or back edges or both front and back edges of which shelves are bent over or flanged so as to retain the bearing strips in place.

5,049 of 1906.—C. E. D. WARING: *Ferro-concrete Tanks and Reservoirs.*

This invention relates to a ferro-concrete tank or reservoir having embedded in the cells thereof plates or sheets of suitable material adapted to form either a continuous barrier to the passage of water or so arranged as to overlap with the spaces between the overlapping parts filled with concrete, said plates being either keyed to the concrete by projections fastened thereto, or employed with or without said keying projections in combination with metal reinforcements of the known type.

15,363 of 1905.—M. S. SALTER: *Counting and Registering Mechanism Applied to Locks, Latches and the like.*

This relates to a registering lock for lavatory and other doors having the main bolt opened independently from the outside or inside, and counting mechanism actuated on opening the door, a second bolt operating the indicator and also the counting mechanism if the latter is not already set, which is closed independently, but withdrawn together with the main bolt.

15,651 of 1905.—J. N. RUSSELL: *Heating of Buildings by the Circulation of Steam or Vapour.*

This relates to an installation for heating buildings by the circulation of steam or vapour, wherein a partial vacuum is maintained in the return portion of the heating cycle, and comprises the method of automatically effecting the maintenance of a predetermined difference of pressure between the supply and return portions of the cycle, which consists essentially in utilising variations from the normal difference of pressure between the two portions of the cycle, by co-action with a yielding resistance of substantially constant value, to control the pressure in the supply portion of the cycle, by regulating the supply of motive power to the apparatus which serves to maintain a partial vacuum in the return portion of the cycle.

17,671 of 1905.—G. CHISHOLM: *Socket Connexions between Water-closet Pans and Soil Pipe Bends.*

This relates to socket connexions between water-closet pans and soil-pipe bends, and consists of a socket formed from sheet metal, and which is provided with a stamped or spun annular recess at or near its outer end.

18,066 of 1905.—O. C. KINGCAID: *Valve Water-Closets and In-flushing Apparatus therefor.*

This relates to a valve water-closet and flushing apparatus therefor, and consists of a casing, a diaphragm in said casing having an aperture and a flange surrounding said aperture and constituting a seat, a bowl mounted in said seat, stems extending through slots in opposite sides of the aperture valve members at the lower ends of said stems co-operating to form a closure for the bowl and counterweights at the upper ends of the stems.

16,049 of 1905.—W. D. TUCK: *Scaffolding.*

This relates to a scaffolding, and consists in the combination of pudlock brackets in halves with bolts and nuts for fastening the half-brackets together and clamping the pudlocks to the structure, angle pieces carried by the pudlocks, bolts and a coupling bolt between each opposite pair of angle pieces.

20,115 of 1905.—A. BRUCE: *Ball or Float Cocks.*

This relates to a ball or float cock, and consists of a contrivance for deadening the noise due to the rush of water whenever the cock is opened, and consists of a cup or vessel which is removably fitted to the cock below the outlet thereof, and is provided with a cap or cover having a depending rim which directs the water downwards.

20,043 of 1905.—W. E. MORRIS: *Manufacture of Dust Preventers for Domestic Fire Grates.*

This relates to the manufacture of a dust preventer for domestic fire-grates, consisting in turning over and strengthening the edges of the blank, stamping a raised pattern on the same to extend round the front and sides of the dust preventer, stamping a gutter along each to the larger sides of the blank to form the bottom bead and the top bead, which latter is strengthened by a bar laid and enclosed therein, and finally forming the rounded ends of the dust preventer by bending the end portions of the blank betweeen a block made with a flange to fit in the bottom channel of the blank and a plate or jacob which is grooved to suit the blank and the bottom bead of the same, and has a flange to take under the bottom of the blank to prevent the same from buckling whilst it is being bent.

20,860 of 1905.—W. KINDLER: *Kitchen Ranges.*

This relates to a kitchen range, and consists of a ventilator adapted to lead the air sucked in from outside the range directly beneath the range grate, or, by turning a flap provided for this purpose, into the flue of the range.

21,178 of 1905.—H. SIMMINS: *Safety Door Bolt.*

This relates to a safety door bolt, and is distinguished by having the removable pin which can be passed through or into the shoot bolt when in its extended or shot position, in such a way as to prevent the shoot being pushed back without the removal of the pin.

22,312 of 1905.—W. MORGAN: *Chimney-pieces.*

This relates to a box or like chimney-piece having its jambs, frieze and shelf each complete in itself, and formed of suitably-shaped tiles assembled together and held in the required position to form the respective parts by a cement or other backing.

18,249 of 1905.—G. ROSE: *Apparatus for Repairing Drains.*

This relates to an apparatus for repairing drains, and consists of a plain spindle on which are mounted two rubber discs with a plate bolted to the back of the front disc, and with a collar fixed to the outer side of each disc.

20,781A of 1905.—W. D. HARDING: *Porous Drain-pipe.*

This relates to the construction of drain and the like pipes having tubes which are entirely or partly porous, with ends either or both of which are solid or non-porous.

24,839 of 1905.—J. E. W. BRYNING: *Tools for Roughing, Shaping, and Finishing Stone.*

This relates to an apparatus for roughing, shaping and finishing stone, comprising heads carrying a beam, a number of sets of spaced blades, the closeness of which are varied by packing strips of varying width and means for attaching said sets of blades in successive and in correct position to the beam.

1172 of 1906.—A. ABY: *Water Heating Arrangements for Gas and like Cooking Stoves.*

This relates to a cooking apparatus with an arrangement for heating water, and is characterised by the fact that the hollow part of the apparatus is subjected to heat, and is in communitation with a water vessel placed above by means of two pieces, one of which terminates at the bottom, whilst the opening to the other one is situated higher up for the purpose of obtaining a circulation of the water.

SOME RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

July 2.—By WILKINSON, SON, & WELCH (at Brighton).

Brighton.—9, King's-rd. (s.), f., y.r. 100l.	£1,200
36, Regency-sq., f., y.r. 190l.	1,800

July 3.—By NICHOLAS, DENYER, & CO. (at Tonbridge).

Tonbridge, Kent.—1 to 6, The Ter., f., e.r. 234l. 6s.	3,775

July 4.—By KENSLEYS' (at Romford).

Romford, Essex.—1 to 5, Gage's-cottages, f.	390
St. Andrew's-rd., "Lawn Cottage," f.	340
Kerkshaw-rd., freehold building plot	100
Dagenham, Essex.—1 to 4, Rectory-rd., f.	650
1 to 24, Victoria-cottages, f.	2,485
25 to 29, Gladstone-ter., f.	665

By FAREBROTHER, ELLIS, & CO. (at Biggleswade).

Biggleswade, Beds.—Drove-la., three building sites, 3 acres, f.	865
The Baulk, a building site, 1 a. 1 r. 24 p., f.	300

July 5.—By THURGOOD & MARTIN, & WINTERTON & SONS (at Stoke-on-Trent).
Draycott, Staffs.—The Draycott Estate, 3,830 a. 0 r. 4 p., f. (in two lots) £99,000

By CECIL HOBDAY (at Putney).
Putney.—Dryburgh-rd., "Bretby," u.t. 77¼ yrs., g.r. 16l. 16s., e.r. 100l. 1,550
12, Bective-rd. (s.), f., y.r. 60l. 875

July 6.—By LANGRIDGE & FREEMAN (at Tunbridge Wells).
Crowborough, Sussex.—South View, freehold building land, 7 a. 1 r. 29 p. 575

By HASLEM & SON (at Charlbury).
Charlbury, Oxon.—"Banbury Hill Farm," 23 a. 0 r. 18 p., f. 530
Various enclosures, 27 a. 3 r. 8 p., f. 830
Six freehold cottages 315

July 7.—By NORRIS & DUVALL (at Hertford).
Great Almwell, Herts.—"Brooms Farm," 42 a. 3 r. 10 p., f. (in lots) 3,950
Ware, Herts.—86 and 88, High-st. (s.), f., y.r. 42l. 825
Walton-rd., four freehold building sites 850

July 9.—By BALLS & BALLS.
Fyfield.—"Little Widney Farm," 46 a. 1 r. 5 p., f., y.r. 50l. 15s. 5d. 1,200
Three freehold enclosures, 22 a. 2 r. 8 p., f. .. 530

By ERNEST J. GALE.
Mount Bures, &c., Essex.—"Balls Farm," 104 a. 1 r. 1 p., f., p. 850
Tillingham, Essex.—"Brick House Farm," 24 a. 1 r. 3 p., f., p. 325
"Marks Farm," 158 a. 2 r. 23 p., f., p. 1,150
"Stows Farm," 155 a. 3 r. 36 p., f., p. 900
"Brook Fields," 14 a. 1 r. 19 p., f., p. 175
"Leggatt's and Watts Farm," 187 a. 3 r. 1 p., f., p. 1,600
"Smarts" and 4 a. 3 r. 27 p., f., p. 150

By G. A. MCDOWALL.
West Ham.—Gift-la., "Henden's Yard" (site), c., y.r. 10l. 300

By MAY & ROWDEN.
Marylebone.—10 and 11, Molyneux-st., f., e.r. 100l. 1,300

By ROGERS, CHAPMAN & THOMAS.
South Kensington.—34, Eardley-cres., u.t. 60 yrs., g.r. 8l., y.r. 60l. 500
Merton.—5, Nursery-rd., f., w.r. 24l. 14s. 210
12 and 13 Park-road, f., w.r. 50l. 14s. 400

By SEDWICK, SON & WEALL.
Ruislip, Middx.—Cheney Farm-rd., a freehold orchard, 3 a. 1 r. 25 p. 620
Eastcote Halt-rd., a freehold enclosure, 2 a. 2 r. 12 p. 260

July 10.—By COCKETT & HENDERSON.
Wanstead.—13, Grove-rd., f., e.r. 50l. 500

By SIMPSON & MOORE.
New Cross.—2, Shardeloes-rd., u.t. 46 yrs., g.r. 4l., y.r. 32l. 235
6, Shardeloes-rd., u.t. 53½ yrs., g.r. 6l., e.r. 34l. 260
18 and 20, New Cross-rd., f., y.r. 82l. 1,050
Pomeroy-st., the "Carlton Arms" b.h., f., y.r. 35l. 580
3, Pomeroy-st. (s.), f., y.r. 20l. 405

By TRESIDDER & CO.
Wimbledon.—18, South Park-rd., u.t. 71 yrs., g.r. 10l., p. 550

By S. & G. KINGSTON (at Spalding).
Whaplode, Lincs.—"Eagle House Estate," 77 a. 0 r. 19 p., f. 3,400

By A. J. FOWKES (at Chiswick).
Acton Green.—68, Rothschild-rd., u.t. 86½ yrs., g.r. 4l. 10s. 325
Gunnersbury.—1, 2, and 4, Wellesley Villas, u.t. 97 yrs., g.r. 21l., y.r. 107l. 1,160

By THORNBORROW & CO. (at Penrith).
Bampton, Westmorland.—The Fieldgate Estate, 43 a. 0 r. 30 p., f. and c. 2,206
Watermillock, Cumberland.—The Baldhow Estate, 85 a. 1 r. 6 p., f. 1,275

By ORGILL, MARKS, & BARLEY (at Masons' Hall Tavern).
Haymarket.—8t. Alban's-pl., The "White Lion" p.h., u.t. 6 yrs., y.r. 80l., with goodwill 600

By E. J. VIDLER (at Ashford).
Bethersden, Kent.—"Russell Farm," 51 a. 2 r. 27 p., f. 1,010
"Tippett Farm," 62 a. 2 r. 0 p., f. 750
"Ring Farm," 22 a. 0 r. 20 p., f. 520
"Star Farm," 26 a. 3 r. 19 p., f. 495
Various enclosures, 63 a. 1 r. 30 p., f. 935
Part of "Wissenden Farm," 62 a. 3 r. 39 p., f. 450
Smarden, Kent.—"Little Romden Farm," 133 a. 2 r. 38 p., f. 2,100
"Snapmill Farm," 24 a. 2 r. 6 p., f. 550
"North American Fields," 1 a. 2 r. 39 p., f. ... 60
"Mainey Wood," 6 a. 2 r. 21 p., f. 30

June 11.—By BAXTER, PAYNE, & LEPPER.
Kentish Town.—22 and 24, Rhyl-st. (s.), 56½ yrs., g.r. 14l., y.r. 92l. 515
Caledonian-road.—Freeling-st., l.g.r. 19l., u.t. 38½ yrs., g.r. 3l. 225
New Cross.—3 to 8, Park-rd., u.t. 26 yrs., g.r. 41l. 1s. 6d., y.r. 256l. 1,195
Peckham.—14, Montpelier-rd., u.t. 44½ yrs., g.r. 6l. 6s., y.r. 32l. 300

By J. C. PLATT.
Hounslow, Middx.—1 to 12, Oxford-ter., f., w.r. 313l. 3,080
Hammersmith.—160, "The Grove, u.t. 70 yrs., g.r. 11l., e.r. 55l. 620
Chiswick.—14, Sutton Court-rd., f., p. 890

By RAWLINS & CO.
Wimbledon.—Quick-rd., f.g. rents, 26l., reversion in 73 yrs. 600
Hardy-rd., f.g.r. 26l. 12s., reversion in 73½ yrs. 435
Haydons-rd., f.g.r. 26l. 12s., reversion in 73½ yrs. 565
Wandsworth.—Atheldene-rd., f.g.r. 16l. 10s., reversion in 91 yrs. 375

By FRANKLIN & SON (at Braintree).
Finchingfield, Essex.—"Lophams Farm," 195 a. 2 r. 4 p., f. and c., p. 1,350
Stebbing, Essex.—A freehold residence and 0 a. 2 r. 14 p. £400
Three enclosures of land, 14 a. 2 r. 63 p., f. .. 370

July 12.—By J. W. COADE.
Portman-square.—12, Old Quebec-st., u.t. 4 yrs., g.r. 15l., y.r. 95l. 100

By A. & A. FIELD.
Mile End.—22, Underwood-st., f., w.r. 31l. 4s. 300

By E. H. HENRY.
Clapham.—30, Lydon-rd., u.t. 64 yrs., g.r. 7l. 17s. 6d., p. 595
Tooting.—110 and 112, Eswyn-rd., u.t. 97 yrs., g.r. 11l., w.r. 70l. 4s. 445
35 and 49, Chertsey-st., u.t. 97½ yrs., g.r. 10l., w.r. 62l. 8s. 390
Dulwich.—Dulwich-rd., a freehold building site 200

By C. C. & T. MOORE.
Commercial-road East.—32 to 50 (even), Umberston-st., f., w.r. 224l. 18s. 1,600
Bow.—17 and 19, Violet-rd., f., w.r. 52l. 465
Poplar.—29, Goodliffe-st. and 19, Alton-st., f., w.r. 41l. 12s. 250
Leytonstone.—21, Forest-drive East, u.t. 76 yrs., g.r. 7l., p. 365

By NEWBON, SHEPHERD & EDWARDS.
Hoxton.—29, Buckland-st., u.t. 28 yrs., g.r. 5l., e.r. 36l. 255
New Southgate.—8, Friern Barnet-rd., u.t. 47 yrs., g.r. 5l., e.r. 45l. 250

By STIMSON & SONS.
Wandsworth.—114 and 116, High-st. (s.), f., y.r. 98l. 1,175
Homerton.—Durrington-rd., f.g.r. 5l., reversion in 67 yrs. 100
Camberwell.—58, Paulet-rd., u.t. 61 yrs., g.r. 7l., y.r. 44l. 280
Woodford.—Tavistock-rd., "Oakleigh," u.t. 78 yrs., g.r. 10l. 10s., e.r. 45l. 200
Peckham.—24, Clifton-cres., f., y.r. 28l. 430

By DANIEL WATNEY & SONS.
Smitham Bottom, Surrey.—Brighton-rd., freehold building land with the Stoats Nest Farmhouse, etc., 20 a. 0 r. 23 p. 11,600

By FAREBROTHER, ELLIS, & CO.
Tooting.—6, Longley-rd., u.t. 77½ yrs., g.r. 10l., y.r. 50l. 500
St. Pancras.—35 to 41 (odd), Drummond-st., and 23 and 24, Lancing-st., u.t. 13 yrs., g.r. 16l., y.r. 210l. 1,300
Balham.—36, 37, 39, 40, 41, 42, 43, and 45, Ouseley-rd., f., y.r. 306l. 3,785
26, 28, 30, 64, and 66, Sarsfeld-rd., f., y.r. 187l. 2,000
Acton.—5 to 11 (odd), Shaa-rd., u.t. 73 yrs., g.r. 40l., y.r. 196l. 1,400
Tottenham.—14 to 25, Nelson-rd., u.t. 73 yrs., g.r. 48l., w.r. 280l. 1,250

By HALL, PAIN, & CO. (at Portsmouth).
Farlington, Hants.—"Oaklands Farm," 17 a. 2 r. 28 p., f. 1,400
Two freehold building plots, 1 a. 1r. 2 p. 255

July 13.—By POTTERS.
Hampstead.—Windsor-ter., "Elm Bank," and ½ an acre, u.t. 43 yrs., g.r. 24l., p. 2,425
4, Pilgrim's-la., u.t. 83 yrs., g.r. 8l., e.r. 55l. ... 625

By PROTHEROE & MORRIS.
Leyton.—5 and 6, Station-rd., u.t. 71½ yrs., g.r. 12l., e.r. 70l. 350
Leytonstone.—55 and 57, Southwell Grove-rd., f., w.r. 62l. 8s. 520
Forest Gate.—Field-rd., f.g. rents 8l. 8s., reversion in 51 yrs. 200

By W. B. HALLETT.
City.—Angel-court, f.g.r. 60l., reversion in 31 yrs. 3,560
Whitechapel.—8, Old Montague-st, also Nag's Head Yard, area 14,400 ft., f., y.r. 330l. 4,000
Chelsea.—16, 22, 24, 26, 28, 32, 34, 36, 38, 42, 44, and 46, Fernshaw-rd., u.t. 47¾ yrs., g.r. 74l., y.r. 574l. (in lots) 4,875
Portman-square.—5, Montagu-pl., u.t. 18 yrs., g.r. 90l., p. 1,000

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. beerhouse; p.h. for public-house; o. for office; s. for shops; ct. for court.

MEETING.

SATURDAY, JULY 21.

Association of Municipal and County Engineers.—Western Counties District Meeting, to be held at Trowbridge and Devizes.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 9 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 6 0	" " "
Picked Stocks for Facings	2 15 0	" delivered.
Flettons	1 7 0	" at railway depôt:
Red Wire Cuts	1 13 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire	3 15 0	" " "
Do. Bullnose	4 0 0	" " "
Best Stourbridge Fire Bricks	3 14 0	" " "

BRICKS, &c. (continued).

GLAZED BRICKS.

	£ s. d.	
Best White and Ivory Glazed Stretchers	12 0 0	per 1000 at railway depôt.
Headers	11 0 0	" " "
Quoins, Bullnose, and Flats	16 0 0	" "
Double Stretchers	19 0 0	" " "
Double Headers	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamferred, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers, and Header	12 0 0	" " "
Quoins, Bullnose, and Flats	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamferred, Squints	14 0 0	" " "
Second Quality White and Dipped Salt Glazed	2 0 0	" less than best.

	s. d.	
Thames and Pit Sand	6 9	per yard, delivered.
Thames Ballast	5 3	" "
Best Portland Cement	25 0	per ton, "
Best Ground Blue Lias Lime	19 0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	" "
PORTLAND STONE (30 ft. average)—Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 1	" "
White Basebed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 2½	" "

	s. d.	
Ancaster in blocks	1 10	per ft. cube, deld. rly. depôt
Beer "	1 6	" "
Greenshill "	1 10	" "
Darley Dale in blocks	2 4	" "
Red Corsehill "	2 2	" "
Closeburn Red Freestone	2 0	" "
Red Mansfield "	2 4	" "

YORK STONE—*Robin Hood Quality.*

Scappled random blocks	2 10	" "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per ft. super., "
6 in. rubbed two sides ditto, ditto	2 6	" "
3 in. sawn two sides slabs (random sizes)	0 11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	" "
1½ in. to 2 in. ditto, ditto	0 6	" "

HARD YORK—

Scappled random blocks	3 0	per ft. cube, "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 8	per ft. super., "
6 in. rubbed two sides ditto	3 0	" "
3 in. sawn two sides slabs (random sizes)	1 2	" "
2 in. self-faced random flags	0 5	" "

	s. d.	
Hopton Wood (Hard Bed) in blocks	2 0	per ft. cube, deld. rly. depôt.
" " " 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
" " " 3 in. sawn both sides random slabs	1 0	" "
" " " 2 in. do.	0 8½	" "

SLATES.

In. In.	£ s. d.	
20×10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20×12 " "	13 17 6	" "
20×10 first quality "	13 0 0	" "
20×12 " "	13 15 0	" "
16×8 " "	7 5 0	" "
20×10 best blue Portmadoc	12 12 6	" "
16×8 " "	6 12 6	" "
20×10 best Eureka unfading green	15 17 6	" "
20×12 " "	18 7 6	" "
18×10 " "	13 5 0	" "
16×8 " "	10 5 0	" "
20×10 permanent green	11 12 6	" "
18×10 " "	9 12 6	" "
16×8 " "	6 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1000 at rly. depôt.
Hip and Valley tiles	3 7	per doz. "
Best Broseley tiles	50 0	per 1000 "
Do. Ornamental tiles	52 6	" "
Hip and Valley tiles	4 0	per doz. "
Best Ruabon red, brown, or brindled do. (Edwards)	57 6	per 1000 "
Do. Ornamental do.	60 0	" "

TILES (*continued*).

	s.	d.	
Hip tiles	4	0	per doz at rly.depôt.
Valley tiles	3	0	" "
Best Red or Mottled Staffordshire do. (Peakes)	51	9	per 1000 "
Do. Ornamental do.	54	6	" "
Hip tiles	4	1	per doz. "
Valley tiles	3	8	" "
Best "Rosemary" brand plain tiles	48	0	per 1000 "
Best Ornamental tiles	50	0	" "
Hip tiles	4	0	per doz. "
Valley tiles	3	8	" "
Best "Hartshill" brand plain tiles, sand-faced	50	0	per 1000 "
Do pressed	47	6	" "
Do. Ornamental do.	50	0	" "
Hip tiles	4	0	per doz. "
Valley tiles	3	6	" "

WOOD.

Building Wood.	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13 10 0	... 15 0 0
Deals: best 3 by 9	13 0 0	... 14 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 0 0	... 12 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best.
Battens: seconds	0 10 0	" "
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	... 10 0 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	... 9 10 0
Foreign Sawn Boards—		
1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	"
	At per load of 50 ft.	
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	... 5 0 0
Seconds	4 0 0	... 4 10 0
Small timber (8 in. to 10 in.)	3 12 6	... 3 15 0
Small timber (6 in. to 8 in.)	3 0 0	... 3 10 0
Swedish balks	2 10 0	... 3 0 0
Pitch-pine timber (30 ft. average)	4 0 0	... 4 15 0

Joiners' Wood.	At per standard.	
White Sea: first yellow deals, 3 in. by 11 in.	24 0 0	... 25 0 0
3 in. by 9 in.	22 0 0	... 23 0 0
Battens, 2½ in. and 3 in. by 7 in.	6 10 0	... 18 0 0
Second yellow deals, 3 in. by 1 in.	18 10 0	... 20 0 0
" " 3 in. by 9 in.	17 10 0	... 19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	... 14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	13 10 0	... 15 0 0
Battens, 2½ in. and 3 in. by 7 in.	11 0 0	... 12 0 0
Petersburg first yellow deals, 3 in. by 11 in.	21 0 0	... 22 10 0
Do. 3 in. by 9 in.	18 0 0	... 19 10 0
Battens	13 10 0	... 15 0 0
Second yellow deals, 3in. by 11in.	16 0 0	... 17 0 0
Do. 3 in. by 9 in.	14 10 0	... 16 0 0
Battens	11 0 0	... 12 10 0
Third yellow deals, 3 in. by 11 in.	13 0 0	... 14 0 0
Do. 3 in. by 9 in.	12 10 0	... 14 0 0
Battens	10 0 0	... 11 0 0
White Sea and Petersburg—		
First white deals, 3 in. by 11 in.	14 10 0	... 15 10 0
" " 3 in. by 9 in.	13 10 0	... 14 10 0
Battens	11 0 0	... 12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	... 14 10 0
" " 3 in. by 9 in.	12 10 0	... 13 10 0
" " battens	10 0 0	... 11 0 0
Pitch-pine: deals	18 0 0	... 21 0 0
Under 2 in. thick extra	0 10 0	... 1 0 0
Yellow Pine—First, regular sizes	44 0 0	upwards.
Oddments	32 0 0	"
Seconds, regular sizes	33 0 0	"
Yellow Pine oddments	28 0 0	"
Kauri Pine—Planks, per ft. cube	0 3 6	... 0 5 0
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 3 0	... 0 3 6
Small " "	0 2 6	... 0 2 9
Wainscot Oak Logs, per ft. cube	0 5 6	... 0 6 0
Dry Wainscot Oak, per ft. sup. as inch	0 0 8½	... 0 0 9½
¾ in. do. do	0 0 7	... —
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	... 0 1 0
Selected, Figury, per ft. super. as inch	0 1 6	... 0 2 6
Dry Walnut, American, per ft. super. as inch	0 0 10	... 0 1 0
Teak, per load	17 0 0	... 22 0 0
American Whitewood Planks, per ft. cube	0 4 0	... 0 5 0
Prepared Flooring, etc.—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	... 0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	... 0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	... 1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	... 0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	... 0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	... 0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	... 0 13 6
1 in. by 7 in. " "	0 14 0	... 0 18 0
¾ in. by 7 in. white " "	0 10 0	... 0 11 6
1 in. by 7 in. " " "	0 12 9	... 0 15 0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	7 0 0	... 7 10 0
Compound Girders, ordinary sections	9 0 0	... 10 0 0
Steel Compound Stanchions	12 0 0	... 13 0 0
Angles, Tees, and Channels, ordinary sections	9 0 0	... 10 0 0
Flitch Plates	9 0 0	... 10 0 0
Cast Iron Columns and Stanchions including ordinary patterns	7 10 0	... 8 10 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
Iron—		
Common Bars	8 0 0	... 8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	... 9 0 0
Staffordshire "Marked Bars"	10 10 0	... —
Mild Steel Bars	8 15 0	... 9 0 0
Hoop Iron, basis price	9 5 0	... 9 10 0
" " Galvanised	17 0 0	... —
("And upwards, according to size and gauge.)		
Sheet Iron Black—		
Ordinary sizes to 20 g.	9 10 0	... —
" " 24 g.	10 10 0	... —
" " 26 g.	12 0 0	... —
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	14 0 0	... —
Ordinary sizes to 22 g. and 24 g.	14 10 0	... —
" " 26 g.	15 0 0	... —
Sheet Iron, Galvanised, flat, best quality—		
Ordinary sizes to 20 g.	17 0 0	... —
" " 22 g. and 24 g.	17 10 0	... —
" " 26 g.	19 0 0	... —
Galvanised Corrugated Sheets—		
Ordinary sizes 6 ft. to 8 ft. 20 g.	14 0 0	... —
" " 22 g. and 24 g.	14 10 0	... —
" " 26 g.	15 15 0	... —
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 10 0	... —
Best Soft Steel Sheets, 22 g. & 24 g.	12 10 0	... —
" " " 26 g.	14 15 0	... —
Cut Nails, 3 in. to 6 in.	9 10 0	... 9 15 0
(Under 3 in., usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
Lead—Sheet, English, 3lb. and up.	19 5 0	... —
Pipe in coils	19 15 0	... —
Soil pipe	22 5 0	... —
Compo pipe	22 5 0	... —
Zinc—Sheet—		
Vieille Montagne ton	33 0 0	... —
Silesian	32 15 0	... —
Copper—		
Strong Sheet per lb.	0 1 1	... —
Thin " "	0 1 2	... —
Copper nails "	0 1 0	... —
Brass—		
Strong Sheet "	0 1 0	... —
Thin " "	0 1 1	... —
Tin—English Ingots "	0 1 10	... —
Solder—Plumbers' "	0 0 9	... —
Tinmen's "	0 0 11	... —
Blowpipe "	0 1 0	... —

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

15 oz. thirds	2½d. per ft. delivered.
" fourths	1¾d. " "
21 oz. thirds	3¼d. " "
" fourths	2¾d. " "
26 oz. thirds	4¼d. " "
" fourths	3¾d. " "
32 oz. thirds	5d. " "
" fourths	4¼d. " "
Fluted Sheet, 15 oz.	3¾d. " "
" 21 oz.	4¼d. " "

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

¼ Hartley's	2¼d. per ft delivered.
⅜ "	2¾d. " "
½ "	3¼. " "
Figured and Oxford Rolled "Oceanic" Glass, white	4d. " "
Do. " tinted	5¼d. " "

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 1 10
" " " in barrels	"	0 1 11
" " " in drums	"	0 2 1
Boiled " " in pipes	"	0 2 0
" " " in barrels	"	0 2 1
" " " in drums	"	0 2 3
Turpentine in barrels	"	0 3 10
" in drums	"	0 4 0
Genuine Ground English White Lead	per ton	22 10 0
Red Lead, Dry	"	21 10 0
Best Linseed Oil Putty	per cwt.	0 7 0
Stockholm Tar	per barrel	1 13 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 6
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TERMS OF SUBSCRIPTION.

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TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

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All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

ANGLESEY.—For additions and alterations to the "Elim" C.M. Chapel, Llanddensant. Mr. J. Owen, F.R.I.B.A., Menai Bridge and Holyhead:—
Hugh & J. Williams, Fron Deg, Llanrlydd d £717

BRADFORD.—For erecting mechanics' and tinners' workshop in Frederick-street and Eastbrook-lane. Messrs. T. C. Hope & Son, architects, 23, Bank-street, Bradford. Quantities supplied by the architects:—

Masons and Ironwork: Normington & Proctor*	Total amount of accepted tenders, £1,065.
Joiners: Toothill & Balmforth*	
Plumber: S. Rushworth*	
Plasterer: W. Hargreaves*	
Slaters: J. Walsh & Sons*	

[Total of highest tenders for the same work, £1,360. 65 tenders were received.]
[All of Bradford and neighbourhood.]

BRADFORD.—For new warehouse in Thornton-road and Quebec-terrace. Mr. E. H. Parkinson, architect, Queensgate-chambers, Bradford:—

Yorkshire Hennebique Contracting Co., Ltd., Leeds	£2,554 14 6
Masons: Pakes, Kershaw, & Sons, Bradford	
Joiner: W. Cowan, Bradford	
Plumber: E. Fox, Bradford	
Slaters: T. Nelson & Son, Bradford	
Plasterers: T. Cordingley & Sons, Bradford	
Painter: T. H. Hewitt, Bradford	

BRIGHTON.—For internal and external repairs, painting etc., to schools, for the Education Committee. Messrs. T. Simpson & Son, surveyors, 17, Ship-street, Brighton:—

Pelham-street Schools.			
G. R. Lockyer	£198 0 0	E. Howell	£173 0 0
G. Ayling & Sons	179 0 0	J. Barnden‡	168 0 0
Geering & Sons	179 0 0	Bell & Sons	152 8 2
Gates & Sons	175 0 0	Olliver & Sons	149 0 0
Preston-road and Hanover-terrace Schools.			
J. Barnden	£63 0	Geering & Sons	£58 0
Holloway Bros.	61 8	G. R. Lockyer‡	57 15
Gates & Sons	60 19	Bell & Sons	47 7
Queen's Park and St. Luke's-terrace Schools.			
Geering & Sons	£104	E. Howell	£70
J. D. Cheal	76	J. Barnden	65
Olliver & Sons	72	Gates & Sons‡	65
York-place Girls' School.			
G. R. Lockyer	£258	Gates & Sons‡	£170
Geering & Sons	254	Olliver & Sons	167
J. Barnden	187		
Middle-street I. School.			
Geering & Sons	£56 0 0	Gates & Son	£37 10 0
J. Barnden	43 10 0	G. R. Lockyer	35 0 0
E. Howell	42 5 0	Bell & Sons‡	29 13 6
J. D. Cheal	38 15 0		
Richmond and Sussex-street Schools.			
Geering & Sons	£219	Olliver & Sons	£169
Gates & Sons	180	J. Barnden‡	165
Stamford-road Schools.			
G. Ayling & Sons	£137 0 0	Gates & Sons	£69 0 0
J. D. Cheal	98 0 0	G. R. Lockyer	68 0 0
Geering & Son	74 0 0	J. Barnden	63 10 0
E. Howell	71 0 0	Bell & Sons‡	52 13 6
York-place Boys' School (Electric Light).			
Durell & Co.	£368 0 0	H. J. Galliers	£249 15 9
Page & Miles	268 15 0	G. Virgo	240 15 0
Adams Bros.	238 10 0	C. Reed & Sons*	175 10 0
Lewes-road Schools (Caretaker's House).			
J. Barnden	£7 8 6	Gates & Sons	£6 19 0
J. D. Cheal	7 5 0	Holloway Bros.‡	6 17 6
Pupil Teachers' Centre (Laboratory Fittings).			
G. R. Lockyer	£89 15	Barnes & Sons	£84 0
Holloway Bros.	89 8	Sattin & Evershed‡	64 0
Finsbury-road Schools (Repairs to Heating Apparatus).			
G. Virgo	£85	J. Phillips & Son	£5[illegible]
J. Grundy‡	67		

[‡ Recommended for acceptance].

BRIGG.—For erecting three dwelling-houses in Grammar School-road. Mr. W. H. Buttrick, architect, Home-street, Scunthorpe:—

F. Bilton	£1,554 11	J. Manders,	
C. Clark	1,377 15	Barnetby*	£1,117 0

[Architect's estimate, £1,100.]

BURSLEM.—For erection of additions to works, Dalehall, for Messrs. Keeling & Co. Messrs. R. Scrivener & Sons, architects, Hanley:—

G. Ellis	£1,010 0	W. Cooke	£898 10
S. Heath	923 0	Bennett Bros.	897 0
T. Godwin, Hanley*	900 0	Grant & Sons	895 0
		C. Smith	890 0

CAERPHILLY.—For erecting isolation hospital, Caerphilly. Mr. J. H. Phillips, architect, Windsor-place, Cardiff:—

R. Jones	£12,587	W. Bowers & Co.	£10,990
J. Allen & Sons	12,129	E. R. Evans & Bros.	10,797
G. Hallet	12,000	T. F. Howells	10,700
A. Colbourn	11,998	Hamilton & Millard	10,650
J. Williams	11,973	J. E. Evans	10,589
Knox & Wells	11,950	T. Bevan	10,239
W. Thomas & Co.	11,903	G. Rutter	10,200
S. Jones	11,787	W. T. Morgan	10,145
D. Davies	11,490	A. J. Rossiter	10,040
F. Stanbury	11,477	R. W. Hunter & Co.	9,935
Blacker Bros.	11,400	J. Lewis, Caerphilly*	9,880
Price Bros.	11,290	M. Harding	9,860
J. Jenkins	11,230		
D. G. Price	11,050		

CHARD.—For hydraulic ram, reservoir, and laying on water to Whitestaunton manor house, schools, and vicarage. Messrs. Symes & Madge, architects and surveyors, Somerset House, Chard. Quantities by architects:—

Jenkins & Son	£256 17 6	Phœnix Engineering Co., Ltd.	£174 15 0
A. & T. Tutcher	252 0 0	J. H. Smith	174 15 0
C. J. Ell	215 17 9	Parsons Bros. & Dunster	170 0 0
Dening & Co.	210 0 0	W. Stone, Coombe St. Nicholas, near Chard*	165 0 0
A. Hutchines	198 0 0		
H. J. Spiller & Sons	182 10 0		
O. G. F. Dunn	180 1 3		

[Architects' estimate, £170.]

CHARD.—For the erection of extension buildings to the Holyrood Mill, for Messrs. Gifford, Fox, & Co. Messrs. Symes & Madge, architects and surveyors, Somerset House, Chard. Quantities by architects:—

	Contract No. 2	Contract No. 1.
Gleed Bros.	£2,428 19 3	—
Ellis & Sons	2,394 16 0	—
Ham Hill & Doulting Stone Co.	2,297 15 0	—
J. Cassé	2,260 0 0	£275 0 0
T. Munford	2,171 16 10	188 0 0
A. Poole	2,098 0 0	206 0 0
Harris & Woolcott	2,070 10 6	171 17 6
Parsons, Bros. & Dunster	1,970 0 0	206 10 0
Spiller & Sons, Taunton	*1,938 0 0	*190 0 0

[Architects' estimate, £2,162 5 6, £225 7 6.]

CHESTER-LE-STREET.—For making up private streets, for the Rural District Council. Mr. G. W. Ayton, Highway Surveyor, Chester-le-street. Quantities by the Surveyor:—

	Retaining Wall.	Street Works.
J. McLaren & Son, Gosforth	£325 10 0	*£769 18 11
R. C. Birsley, Stanley	*213 7 6	1,000 5 1
Thompson & Son	321 13 4	896 15 9
G. E. Simpson	301 18 4	947 9 5
Johnson & Strong	316 11 8	—

COVENTRY.—For erecting a motor manufactory and offices on the west side of Foleshill-road. Mr. F. Foster, architect. Masonic-buildings, Coventry. Quantities by the architect:—

B. W. Whitehouse & Son	£12,947 0	Orr Bros.	£11,772 0
J. Worwood	12,845 0	C. Garlick	11,690 0
Kelley & Son	12,355 3	R. & A. R. Cleaver	11,550 0
C. Haywood	12,250 0	A. A. Wincott	11,526 0
C. Griffiths	12,239 0	W. H. Gibbs	11,475 0
J. Parnell & Sons	12,227 0	E. Harris, Coventry*	11,450 0
J. Isaac & Sons	12,004 0	W. Hopkins	11,300 0
C. G. Hill	11,990 0		

COWES (I.W.).—For reconstruction of shop, offices, and stores in Mill-hill-road, for Henry Bannister & Co., rope manufacturers. Mr. J. W. Bessant, architect and surveyor, Pelham-road, Cowes, Isle of Wight:—

W. Barton & Co.	£1,087 10	J. Meader	£982 0
H. E. Day	1,057 0	G. W. Ball, Cowes*	946 0

[Architect's projecting estimate, £901.]

DEVONPORT.—For alterations and additions to Nos. 40 and 41, Fore-street (business premises), for Mr. F. Goodman. Mr. Edgar M. Leest, architect, 14, St. Aubyn-street, Devonport. Quantities by Messrs. Leest & Adams, Devonport:—

Wakeham Bros.	£2,494	Jenkin & Sons	£2,295
J. H. Palmer	2,390	Pearn Bros.	2,254
T. May & Son	2,355	H. J. Allen	2,024
Pearce Bros.	2,297	S. Roberts, Plymouth*	1,950
A. N. Coles	2,297		

ECCLES.—For erecting the Carnegie public library in Church-street, for the Corporation. Messrs. Potts, Son, & Hennings, architects, 34, Victoria-buildings, Victoria-street, Manchester:—

Hardman & Jones, Devonshire-road, Eccles .... £7,200‡

‡ Add provisional sum inserted in quantities, £275.

ELLESMERE PORT.—For making Birchfield-road, for Ellesmere Port and Whitby Urban District Council. Mr. J. M. Hudson, surveyor, Bank-buildings, Ellesmere Port:—

F. G. Davies & Co.	£663 6 9	G. W. Cooke & Co.	£615 0 0
Jones & Hough	649 10 0	J. Parker, Ellesmere Port*	600 0 0
J. W. Harris	627 15 9		

EPSOM.—For Chessington water supply works, for the Rural District Council. Mr. F. A. Pratley, surveyor, Waterloo-road, Epsom:—

A. C. Soan, 124, Leverson-street, Streatham, S.W.* £150

LEYTON.—For cleansing, painting, repairs, and alterations to schools, for the Education Committee. Mr. William Jacques, Architect, 2, Pen-court, Fenchurch-street, E.C.:—

—	Canon Hall-road. (All Exterior.)	Leyton High-road. (All Exterior.)	Newport-road. (All Exterior, and Interior Boys' Department.)	Church-road. (Improvements Caretaker's House.)	Kirkdale road. (Sundry Works.)
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
R. Athey*	216 15 0	69 9 0	254 17 6*	106 0 0	54 15 0
Barrett & Power*	260 0 0	80 0 0	275 0 0	85 0 0*	38 0 0
Calnan & Son	357 0 0	79 0 0	576 0 0	106 0 0	27 15 0
W. J. Clemens*	156 10 0*	64 13 0	—	85 10 0	34 13 6
A. E. Clark	—	71 0 0	453 0 0	108 0 0	28 10 0
F. J. Coxhead	256 0 0	92 0 0	419 0 0	105 0 0	27 0 0
W. Dennison	216 13 6	50 14 0	375 1 5	110 6 11	33 0 0
Evans & Co.	268 0 0	114 0 0	567 0 0	146 12 6	32 12 0
H. C. Horswill	220 0 0	85 0 0	369 0 0	95 0 0	29 0 0
J. W. Holmes	175 0 0	53 0 0	298 0 0	88 0 0	36 0 0
J. Johnson	166 0 0	64 0 0	339 0 0	146 0 0	39 0 0
Loasby & Salmon*	283 0 0	119 0 0	525 0 0	98 0 0	23 0 0*
J. T. Luton	268 0 0	85 0 0	595 0 0	115 0 0	34 10 0
Marshall & Co.	376 10 0	175 0 0	495 0 0	—	—
E. Partridge	399 0 0	126 0 0	640 0 0	114 0 0	37 0 0
J. F. Penn	265 18 0	118 10 0	—	110 0 0	37 17 0
J. J. Quarterman	220 0 0	89 0 0	450 0 0	120 0 0	28 0 0
Richards & Son*	250 0 0	43 0 0*	525 0 0	120 0 0	31 10 0
Runham Brown Bros.	168 0 0	58 0 0	378 0 0	108 0 0	32 0 0
Sands & Burley	—	110 0 9	380 0 0	100 0 0	31 0 0
A. E. Symes	214 0 0	60 0 0	396 0 0	—	—
T. F. White	323 17 5	73 6 6	635 4 8	240 0 0	48 10 6
Woollaston Bros.	210 0 0	100 0 0	388 0 0	96 0 0	65 0 0
Williams & Whitrich	286 17 8	108 12 8	—	87 15 0	25 18 0

HIGHLEY.—For additions at Council school, for Salop Education Committee. Messrs. Gething & Son, architects, Oxford-chambers, Kidderminster:—

C. Griffiths, Stourbridge* £1,070

HINDHEAD.—For new Council schools. Messrs. Jarvis & Richards, Architects to the Surrey Education Committee, 36, Victoria-street, S.W.

J. & M. Patrick	£3,183 0 0	Haslemere Builders	£2,317 0 0
J. B. Potter	2,540 0 0	G. Kemp	2,298 0 0
Drowley & Co.	2,499 0 0	T. J. Hawkins & Co.	2,284 11 8
R. Wood	2,469 0 0	Tompsett & Co.	2,281 0 0
J. J. Pink	2,430 0 0	Mitchell Bros.	2,260 0 0
J. Milton	2,410 0 0	Martin, Wells, & Co.	2,155 0 0
Crosby & Co.	2,383 0 0	G. Chuter*	2,135 12 2
G. Mardon	2,347 0 0		
Goddard & Sons	2,338 0 0		
Chapman & Lowry	2,330 0 0		

LEWISHAM.—For kerbing, channelling and metalling the roadway and paving the footpaths with artificial stone, Bargery road, etc., for Lewisham Borough Council:—

	Kerbing.	Paving.
W. Pearce, Forest Hill*	£824	£237

LITTLEHAMPTON.—For approaches and abutments for steel bridge over the River Arun, for the Urban District Council. Major H. Tulloch, C.B., Engineer, 28, Victoria-street, Westminster:—

A. Thorne, Westminster* £2,343 14 4

LITTLEHAMPTON.—For constructing a steel bridge over the River Arun, for the Urban District Council. Major H. Tulloch, C.B., Engineer, 28, Victoria-street, Westminster, S.W.:—

A. Thorne, 7, Carteret-street, Westminster* £10,645

LLANBRADACH.—For erecting thirty-one houses for Llanbradach Building Club. Mr. J. H. Phillips, architect, Clive-chambers, Windsor-place, Cardiff:—

W. Williams & Son	£259 0 0	Per House.
T. Beavan	249 0 0	
Watkins & Smith	230 10 0	
C. Leather & Sons	219 7 1	
J. Lloyd	215 0 0	
A. Richards	208 0 0	
T. March	206 0 0	
J. S. Thomas	205 0 0	
J. Williams	203 10 0	
H. L. Jones	200 10 0	
H. Shapcott	200 10 0	
T. F. Howells, Cardiff*	198 0 0	
H. Davies & Son	194 10 0	

LONDON.—For the erection of boat-house, Battersea Park, for the London County Council:—

P. B. Evans & Co.	£739 0	H. Bragg & Sons, Ltd.	£517 8 2
Chambers Bros.	632 0	J. Barker & Co., Ltd., Kensington High-street, W.*	494 0 0
W. H. Hyde	614 0		
Martin, Wells, & Co., Ltd.	596 0		
Vigor & Co.	566 0		
F. & H. F. Higgs	555 0		

LONDON.—For the erection of a band-stand, Finsbury Park, for the London County Council:—

Parrott & Isom	£487 10 6	Boulton & Paul, Ltd.	£396 0 0
Stevens & Sons	461 0 0	R. Jackson & Co., 92, Upper Tollington-park, N.*	369 12 1
W. H. Lascelles & Co., Ltd.	445 6 10		
W. J. Clemens	423 18 5		
Chambers Bros.	415 0 0		
F. Smith & Co., Ltd.	404 13 0		

LONDON.—For the erection of extension buildings to the new hospital at Haverstock Hill, for the Committee of Hampstead General Hospital. Messrs. Young & Hall, architects, 17, Southampton-street, Bloomsbury, W.C. Quantities by Messrs. Ruant & Young, 17, Southampton-street, Bloomsbury, W.C.:—

W. Willett	£12,531	Kirk & Randall	£11,516
Gough & Co.	12,414	J. Allen & Sons	11,435
Perry & Co.	12,359	McCormick & Sons	11,392
Patman & Fotheringham	12,210	Davey, Ltd.	11,387
Todson & Sons	12,111	B. E. Nightingale	11,188
Johnson & Co.	11,730	J. Barker & Co.	11,014
Holliday & Greenwood	11,640	W. Lawrence & Son	10,998
Spencer, Santo, & Co.	11,610	G. E. Wallis & Sons, Broadmead Works, Maidstone*	10,949

LONDON.—For Paddington District Post-office enlargement:—

		Credit.
E. J. Clayton	£56,760	£450
J. Simpson & Son	38,985	—
Foster & Dicksee	38,909	206
C. Ansell	38,906	400
J. & W. Drake	37,107	199
Aldin Bros. & Davies	37,000	100
Speechley & Smith	36,900	250
Edwards & Medway	36,900	150
J. Barker & Co., Ltd.	36,052	250
B. E. Nightingale	35,770	100
J. Smith & Sons, Ltd.	35,983	515
Spencer, Santo, & Co.	35,466	150
E. Lawrence & Son	35,274	250
W. Taylor & Co.	35,147	250
W. H. Lorden & Son	35,000	168
Vigor & Co.	34,970	300
W. Johnson & Co., Ltd.	34,783	120
Perry Bros.	34,777	170
C. Wall, Ltd.	34,697	175
H. M. Patrick	34,439	100
J. Garrett & Son	34,183	80
W. King & Son	34,248	207
Martin, Wells, & Co., Ltd.	34,060	—
Killby & Gayford	34,050	193
J. Mowlem & Co., Ltd.	33,970	—
H. J. Williams, Ltd.	32,520	30
J. Chessum & Sons	32,439	139
Galbraith Bros.	31,947	394
Wisdom Bros.	31,485	105
A. Fairhead & Son	31,000	200
J. Allen & Sons, Ltd.*	29,990	315

LONDON.—Sewers, etc., for Finchley Urban District Council:—

Cables.

Callenders Cable and Construction Co.* £15,662 5 3

Whitehall Estates, Broughton-avenue, Sewer.

Killingback* £1,607 3 4

New Sewage Scheme, First Instalment.

C. Ford* £6,766 18 6

Slab Paving.

Atlas Stone Co., 3s. 6½d., per super. yard, for supplying paving two inches thick, laid as directed, including all shaping, cutting, and waste, and making good at back of path.

LONDON BOARD OF EDUCATION TENDERS.

Additional Exit and Cloakroom, etc., in the Infants' Department of the Queen's Head-street School, Islington N.

F. W. Harris	£163 0	L. H. & R. Roberts	£105 0
E. Lawrence & Sons	140 0	J. Grover & Son	96 0
G. S. S. Williams & Son	130 0	F. Bull, 31, Old Hill-street, Clapton*	91 10
McCormick & Sons	111 0		

[The estimate of the architect (Education) comparable with these tenders is £85.]

Woolwich, The "Slade" (Re-division of Rooms).

General Builders, Ltd.	£620	H. Groves	£588
E. P. Bulled & Co.	610	H. Kent, Beacon-road, Hither Green*	586
E. Spencer & Co.	610		

[The estimate of the architect (Education) comparable with these tenders is £584.]

Holborn, Tower-street (Heating).

G. Davis	£486 0	Wenham & Waters, Ltd.	£294 0
H. C. Price Lea & Co.	330 0	Bolton, Fane, & Co.,	280 0
J. Defries & Sons, Ltd.	326 0	Beeson & Sons	280 0
Turner & Co.	305 10	J. Grundy	277 0
Brightside Foundry and Engineering Co., Ltd.	299 0	B. Harlow & Son	277 0
		G. & E. Bradley, Chadwell Iron Works, Elfort-road, Highbury*	265 0

Heating.

(*a*) That the tender of Wenham & Waters, Ltd., amounting to £495, for installing a system of heating at the Senrab-street school (*Stepney*), in accordance with a scheme submitted by them, be accepted.

(*b*) That the tender of Strode & Co., amounting to £597, for installing a system of heating at the Sellincourt-road school (*Wandsworth*), be accepted.

The Provision of the Motor Generators and Switchboards.

Witting, Eborall, & Co., Ltd.	£812 0
Westminster Engineering Co., Ltd.	718 0
Electric Construction Co., Ltd.	665 0
General Electric Co., Ltd., 71, Queen Victoria-street, E.C.*	646 10

Wandsworth, Ensham-street (Erection of Iron Building).

T. Cruwys	£875	A. Leather	£494
W. Bain & Co.	560	F. Smith & Co., Ltd.	469
Croggon & Co., Ltd.	555	J. Harrison & Co., Denmark-road, Camberwell*	430
Humphreys, Ltd.	530		
W. Harbrow	501		
T. J. Hawkins & Co.	498		

Eardley-road, Wandsworth.

W. Read	£349 0	J. Garrett & Son	£293 0
Maxwell Bros.	346 7	Holliday & Greenwood, Loughborough Park Works, Brixton*	247 0
Dowsett & Jenkins	328 0		
W. A. King	320 0		
W. Johnson & Co.	299 0		

Supply of Tubular Boilers.

	Boiler delivered complete.			
	12 in. wide, with 2 tubes.	14 in. wide with 3 tubes.	16 in. wide, with 4 tubes.	18 in. wide, with 4 tubes.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Albion Iron Company	2 8 6	2 15 0	2 19 6	3 5 0
Binns & Speight, Ltd.	2 5 0	2 10 0	2 15 0	2 17 6
H. Coltman & Sons	2 4 3	2 12 6	3 1 0	3 5 0
Hartley & Sugden, Ltd.	2 17 6	3 10 0	4 5 0	4 10 0
Lumley, Son, & Wood, Ltd.	2 5 0	2 10 0	2 17 6	3 0 0
C. W. Trotman, 60 and 62, Long-lane, Borough*	2 0 0	2 10 0	3 0 0	3 2 0

FOR PAINTING AND CLEANING SCHOOLS.

Teesdale-street, Bethnal Green.

R. Woollaston & Co.	£2,043 0	J. S. Fenn	£487 10
H. Bouneau	614 10	Barrett & Power, St. Thomas Works, Hackney*	409 0
J. Hayden & Sons	597 16		
Staines & Son	525 0		

Greenwich-road.

W. Banks	£109 10	W. Hayter & Son, 62, Banning-street, East Greenwich*.	£60 10
H. Groves	83 0		

Sandley-street, Brixton.

W. Fitch	£1,225	Maxwell Bros.	£513
J. Appleby & Sons	842	Rice & Son	497
W. T. Bennett	570	H. Bragg & Sons, 19, Robsart-street, Brixton*	457
W. A. King	557		
Lathey Bros.	535		
W. Read	522		

Queen's Head-street, Islington.

Patman & Fotheringham	£580	J. Grover & Son	£446
T. Cruwys	556	W. Chappell	395
McCormick & Sons	545	L. H. & R. Roberts, 34, Rheidol-terrace, Islington*	336
C. R. Price	472		

Napier-street, Hoxton.

McCormick & Sons	£585	Barrett & Power	£432
Staines & Son	585	W. Chappell, 243, Elgin-avenue, Maida-vale*	430
Grover & Son	494		
Stevens & Sons	446		

Bryon and Bright-street, Poplar.

H. Bouneau	£250 15	G. Barker	£219 0
A. W. Derby	247 0	Vigor & Co., King-street, Poplar*	206 0
J. Haydon & Sons	246 15		
R. Woollaston & Co.	240 0		

"Elm Court," Norwood.

W. Johnson & Co.	£199 0	H. Line	£172 0
E. P. Bulled & Co.	186 0	W. Read, 43, Church-road, Brixton Hill*	147 0
Maxwell Bros.	182 0		
J. & C. Bowyer	173 10		

Upton House Truant School.

J. Stewart	£620 0	F. Stevens & Sons	£363 0
Staines & Son	510 0	R. Woollaston & Co.	360 0
W. Shurmur & Sons	476 0	W. Silk & Son, 13, High-street, Homerton*	337 17
J. Grover & Son	434 0		
Vigor & Co.	398 10		
Barrett & Power	390 0		
H. Bouneau	368 10		

Shoreditch Technical Institute.

W. Cubitt & Co.	£499 0	L. H. & R. Roberts	£386 0
W. Reason	419 10	G. Barker	366 0
Staines & Son	418 0	J. Grover & Son, Wilton Works, Islington*	346 0
Kilby & Gayford	413 0		
W. Shurmur & Sons	401 15		

Choument-road, Peckham.

T. G. Sharpington	£550	E. Triggs	£427
W. T. Bennett	468	R. Proctor & Son	402
H. Bragg & Sons	447	J. Garrett & Son, 83, Balham-hill*	395
W. Chappell	435		

Cubitt Town, Poplar.

Vigor & Co.	£114 0 0	E. Proctor & Son	£99 0
Newell & Lusty	113 10 0	R. Woollaston & Co., 40, Turner's-road, Limehouse*	86 10
W. Banks	109 19 6		
H. Groves	105 0 0		
A. W. Derby	103 0 0		

Wood-street, Woolwich.

R. Woollaston & Co.	£440	J. S. Fenn, 42, William-street, Woolwich*	£298
E. Proctor & Son	390		
H. Groves	373		

Wood's-road, Peckham.

W. A. King	£504 0	W. T. Bennett	£386 0
Lathey Bros.	487 0	W. Hayter & Son	384 10
W. V. Goad	469 0	W. Sayer & Son	379 0
Maxwell Bros.	444 0	H. Kent, Beacon-road, Hither-green*	267 0
W. Chappell	418 0		
J. Garrett & Son	389 0		

Glengall-road, Poplar.

Newell & Lusty	£203 10 0	E. Proctor & Son	£149 0 0
A. W. Derby	194 0 0	R. Woollaston & Co., 40, Turner's-road, Limehouse*	140 0 0
W. Banks	174 18 6		
Vigor & Co.	168 0 0		
H. Groves	160 0 0		

Woolmore-street, Poplar.

H. Bouneau	£656 0	R. Woollaston & Co.	£295 0
J. Haydon & Sons	644 0	A. W. Derby, 60, Mayfair-avenue, Ilford*	291 0
J. S. Fenn	315 0		
G. Barker	311 10		
Vigor & Co.	310 0		

Haverstock-hill, St. Pancras.

J. C. Richards & Co.	£524	Stevens & Sons	£394
G. Foxley	489	W. Chappell, 243, Elgin-avenue, Maida-vale*	350
J. Peattie	449		
Marchant & Hirst	448		
A. H. Inns	440		

Settles-street, Stepney.

R. Woollaston & Co.	£496 0	J. S. Fenn	£399 0
W. Shurmur & Sons	473 10	Vigor & Co.	380 0
W. H. Lascelles & Co.	459 0	A. W. Derby, 60, Mayfair-avenue, Ilford*	374 0
G. Barker	449 0		
W. Chappell	420 0		

Mitcham-lane, Wandsworth.

E. P. Bulled & Co.	£223 10	Dowsett & Jenkins	£182 0
R. L. Ronald	205 0	W. Read, 43, Church-road, Brixton-hill*	158 0
Grace & Marsh	199 10		
H. Leney & Son	183 14		

Gordon House Girls' Home.

Lathey Bros.	£293 0 0	H. Tinkler, 72, Northcote-road, St. Margaret's, Twickenham*	£153 19 11
J. W. Brooking	277 0 0		
Chinchen & Co.	219 15 0		
Speechley & Smith	215 0 0		
S. N. Soole & Son	202 15 0		

FOR PAINTING THE EXTERIORS OF COUNCIL SCHOOLS.

Bolingbroke-road, Battersea.

R. S. Ronald	£320 0	E. P. Rulled & Co.	£217 0
E. Flood	299 0	W. Johnson & Co.	202 0
J. Garrett & Son	265 0	E. Triggs, 92, The Chase, Clapham*	142 0
Lole & Co.	243 15		
Rice & Sons	222 0		

"Springfield," Kennington.

Lole & Co.	£210 0	E. Triggs	£130 0
Lathey Bros.	147 0	Rice & Son, 15, Stockwell-road, S.W.*	126 0
W. Hornett	138 16		
T. Lapthorne & Co.	135 0		

Swaffield-road, Wandsworth.

J. & M. Patrick	£267 0	Lathey Bros.	£159 0
R. A. Jewell	221 0	W. Garrett & Son	146 0
W. & C. Brown	179 0	W. Hornett, 17, Houghton-street, Aldwych*	139 10
W. Johnson & Co.	115 0		
Martin, Wells, & Co.	173 0		

"Tooting Graveney," Wandsworth.

R. S. Ronald	£240	Rice & Sons	£167
Lathey Bros.	177	Holliday & Greenwood, Loughborough Park Works*	146
W. Johnson & Son	169		
J. Garrett & Son	169		

Conway-road, Woolwich.

W. J. Howie	£140 0 0	E. Proctor & Son	£114 0 0
S. Musgrove	138 8 6	J. S. Fenn, 42, William-street, Woolwich*	93 18 9
W. Hayter & Son	134 10 0		
H. L. Holloway	134 0 9		
H. Groves	130 0 0		

"Slade," Woolwich.

S. Musgrove	£133 5	E. Proctor & Sons	£108 0
H. Groves	125 0	J. S. Fenn, 42, William-street, Woolwich*	93 18
W. J. Howie	113 0		
W. Hayter & Son	112 10		

Vicarage-road, Woolwich.

W. Hayter & Son	£239 10 0	E. Proctor & Son	£155 0 0
Newell & Lusty	201 10 0	J. S. Fenn, 42, William-street, Woolwich‡	145 0 0
W. J. Howie	189 0 0		
H. Groves	185 0 0		
S. Musgrove	175 10 6		

‡ Recommended for acceptance.

Lavender-hill, Battersea.

J. & M. Patrick	£383	W. Johnson & Co.	£189
R. A. Jewell	310	E. Triggs	182
J. Garrett & Sons	265	Holliday & Greenwood, Loughboro' Park Works, Brixton*	153
Holloway Bros. (London)	252		
W. Smith & Sons	211		
J. Parsons	210		

Globe-terrace, Bethnal Green.

Staines & Sons	£160 0 0	Stevens & Sons	£123 10 0
J. Haydon & Sons	147 0 0	Vigor & Co.	122 0 0
Press, Robinson, & Co.	137 0 0	H. Bouneau	121 18 6
Barrett & Power	130 0 0	H. Willmott, The Triangle, Hackney*	119 0 0
W. Silk & Sons	129 0 0		

Daubeney-road, Hackney.

McCormick & Sons	£268	G. Barker	£185
C. R. Price	259	Barrett & Power	183
W. Shurmur & Sons	249	H. Bouneau, 1A and 2, Royal Victor-place, Old Ford-road*	170
W. Silk & Son	227		
H. Willmott	205		
Kilby & Gayford	200		

Bow Creek, Poplar.

A. W. Derby	£88 0	H. Groves	£59 0
J. S. Fenn	69 0	Vigor & Co., Kingstreet, Poplar*	57 10
R. Woollaston & Co.	62 0		

"Lawrence," Bethnal Green.

Newell & Lusty	£166 10 0	Stevens & Sons	£136 0 0
J. Grover & Son	162 0 0	Vigor & Co.	127 0 0
Staines & Son	158 0 0	H. Bouneau, 1A and 2, Royal Victor-place, Old Ford-road*	114 0 0
J. Haydon & Sons	152 10 6		
H. Willmott	144 0 0		

Westville-road, Hammersmith.

W. Cubitt & Co.	£281 0 0	S. N. Soole & Son	£168 0 0
J. Richards & Co.	280 0 0	Chinchen & Co.	159 10 0
J. Christie	231 1 9	C. Johnson, 37, Dalling-road, Hammersmith*	135 0 0
Bristow & Eatwell	225 10 0		
G. Neal	170 0 0		

Brewhouse-lane, St. George-in-the-East.

A. W. Derby	£109 0	H. Bouneau	£75 10
J. Haydon & Sons	100 0	G. Barker, 45 & 50, New-road, Whitechapel, E.*	61 6
Barrett & Power	94 0		
Vigor & Co.	84 0		
Press, Robinson, & Co.	76 10		

Silwood-street, Rotherhithe.

H. Line	£216	W. Sayer & Son	£171
R. Woollaston & Co.	188	H. Groves, Stockwell-street, Greenwich*	153
W. J. Howie	174		

Manchester-street, St. Pancras.

J. C. Richards & Co.	£198	T. Cruwys	£180
G. Foxley	190	Marchant & Hirst, 136, Highgate-road*	139
W. Reason	186		

Stanhope-street, St. Pancras.

Parrott & Ison	£199 0	W. Chappell	£145 0
G. Foxley	195 0	A. H. Inns, 36, Camomile-street-chambers, Bishopsgate*	138 0
Chinchen & Co.	177 3		
Cowley & Drake	170 5		
Marchant & Hirst	169 0		

Garratt-lane, Wandsworth (mentally defective).

E. B. Tucker	£45 0	R. S. Ronald	£34 10
Holloway Bros.	44 0	J. & C. Brown, 1, Inman-road, Earlsfield*	24 0
R. A. Jewell	42 0		
Holliday & Greenwood	36 0		

Cator-street, Camberwell.

H. Line	£349 0	J. Parsons	£284 0
T. G. Sharpington	297 0	W. Young	262 6
W. V. Goad	288 0	J. F. Ford	246 10
J. & C. Bowyer	268 0	H. L. Holloway	232 0
W. L. Bragg	265 0		

Leipsic-road, Camberwell.

J. J. Richards	£375 0	Maxwell Bros.	£281 0
W. Fitch	369 10	Rice & Son	247 0
W. V. Goad	337 0	W. L. Bragg	239 0
W. Sayer & Son	312 0	W. Young	231 0
J. F. Ford	283 0		

Star-lane, Fulham.

Bristow & Eatwell	£375 10	W. Chappell	£190 0
R. S. Ronald	360 0	Aldridge & Son, 78, Harlesden-road, Willesden Green*	190 0
S. N. Soole & Son	218 0		
J. Christie	195 0		

Fossdene-road, Greenwich.

W. J. Howie	£175 0	R. Woollaston & Co.	£142 0
H. Groves	170 0	J. S. Fenn, 42, William-street, Woolwich*	139 0
H. L. Holloway	164 0		
E. Proctor & Son	160 0		
W. Hayter & Son	149 10		

Glyn-road, Hackney.

C. R. Price	£174 0	J. Stewart	£134 0
McCormick & Sons	171 0	H. Willmott	127 0
W. Shurmur & Sons	166 10	Barrett & Power, St. Thomas's Works, Hackney*	120 0
W. Silk & Son	147 15		
G. Barker	139 10		

Hamond-square, Haggerston.

A. H. Inns	£328 0	Staines & Son	£163 0
J. Haydon & Sons	219 0	G. Kirby	154 10
W. Shurmur & Sons	204 0	Marchant & Hurst	137 0
F. W. Harris & Co.	192 10	Stevens & Sons, Yonge-park, N.*	134 10
J. Grover & Son	168 0		

York-road, Islington.

W. Reason	£299	Marchant & Hirst	£159
T. Cruwys	244	W. Chappell, 243, Elgin-avenue, Maida Vale*	155
J. C. Richards & Co.	227		
A. H. Inns	168		
Stevens & Sons	162		

Upper Kennington-lane, Kennington.

W. King & Son	£250	E. B. Tucker	£166
J. Appleby & Sons	190	T. Lapthorne & Co.	148
W. Smith & Son	179	Rice & Son, 15, Stockwell-road, S.W.	141
J. F. Ford	172		

Heckford-street, Limehouse.

A. W. Derby	£175 0	G. Barker	£144 10
J. S. Fenn	165 18	R. Woollaston & Co.	134 0
A. E. Symes	155 0	Vigor & Co., Kingstreet, Poplar*	131 0
J. Haydon & Sons	153 10		

Effra-parade, Norwood.

W. T. Bennett	£165	H. Bragg & Sons	£117
J. & C. Bowyer	159	Holliday & Greenwood	101
Grace & Marsh	130	W. Read	97
E. P. Bulled & Co.	129	J. J. Richards, 9, Shannon-grove, Brixton, S.W.*	93
Lathey Bros.	125		
Maxwell Bros.	119		

Arthur-street, Peckham.

H. Line	£169 0	W. J. Howie	£135 0
J. Parsons	156 0	H. L. Holloway	126 0
Martin, Wells, & Co.	149 0	W. Young	123 0
J. Greenwood, Ltd.	148 10	W. Sayer & Son, 86 New Kent-road, S.E.*	123 0
W. Hayter & Son	139 10		
H. Groves	139 0		

Marner-street, Bow and Bromley.

G. Barker	£180 0	Vigor & Co.	£130 0
A. E. Symes	172 0	R. Woollaston & Co., 40, Turner's-road, Limehouse*	99 0
J. Haydon & Sons	140 17		
Stevens & Sons	139 0		

LONDON.—For constructing covered reservoirs, etc., at Fortis Green, Hornsey, for Metropolitan Water Board. Mr. Joseph Francis, C.E. Quantities by Messrs. Fowler & Hugman:—

W. Kennedy, Ltd.	£130,167 3 0
Wilkinson Bros.	105,941 0 0
W. Griffiths & Co., Ltd.	101,939 4 4
F. W. Trimm	100,937 0 0
T. Adams & Sons	98,585 8 1
S. Pearson & Son, Ltd.	91,827 8 6
J. Mowlem & Co., Ltd.	87,783 0 0
T. Docwra & Son	85,340 12 5
C. A. Zadig & Co.	84,756 19 0
G. Trentham	82,703 5 11
J. Aird & Sons	82,464 1 1
D. R. Patterson	80,936 5 10
G. Hay & Co.	80,721 12 11
W. Muirhead & Co.	77,318 13 3
R. H. B. Neal, Ltd.	76,544 19 11
Boulding & Yerburgh	76,529 0 0
J. A. Ewart	75,900 5 11
Kellett's, Ltd.	75,673 9 5
J. Moran & Son, Ltd.	75,631 16 0
Smith & Co.	75,211 0 5
Davies, Ball, & Co.	74,197 11 10
W. Lawrence & Son	74,000 0 0
A. Braithwaite & Co.	73,737 10 4
R. & E. Iles	73,447 0 0
A. E. Nunn	72,072 9 4
Kirk & Randall	71,774 0 0
W. Pattinson & Sons, Ltd.	71,665 9 2
C. Wall, Ltd.	70,283 12 11
Pethick Bros.	69,999 0 0
W. Moss & Son, Ltd.	68,800 18 1
J. Byrom, Ltd., Bury, Lancs*	60,278 17 9

LONDON.—For kerbing, channelling, and making-up roads for the Lewisham Borough Council. Mr. E. Van Putten, A.M.I.C.E., Borough Surveyor, Town Hall, Catford:—

Bargery-road.

B. Martin	£950	Fry Bros.	£912
H. Woodham & Sons	928	J. Mowlem & Co., Ltd.	895
W. H. Wheeler	920	W. Pearce†	824

Dunoon-road.

W. H. Wheeler	£512	B. Martin	£415
Fry Bros.	498	W. Pearce†	388
J. Mowlem & Co., Ltd.	425		

George-lane.

B. Martin	£1,229	W. Pearce	£1,126
J. Mowlem & Co., Ltd.	1,150	H. Woodham & Sons	1,113
		Fry Bros.†	1,059

LONDON.—For the erection of colour works (Building No. 25) at Homerton, N.E., for Messrs. L. Berger & Sons. Mr. H. Tanner, A.R.I.B.A., architect, 12, Regent-street, S.W. Quantities by Messrs. W. H. & P. B. Strudwick:—

Foster & Dicksee	£7,705	Colls & Son	£7,496
Mowlem & Co.	7,700	Chessum & Co.	7,474

LONDON.—For the erection of colour works (Building No. 3) at Homerton, N.E., for Messrs. L. Berger & Sons. Mr. H. Tanner, A.R.I.B.A., architect, 12, Regent-street, S.W. Quantities by Messrs. W. H. & P. B. Strudwick:—

Waring, White, & Co.	£6,731	Carmichael	£6,425
Colls & Son	6,468	Chessum & Co.*	6,145
Holland & Hannen	6,451		

MARLEY.—For erection of a house at Marley, Haslemere. Mr. John H. Howard, architect, The Cottage, Lower-street, Haslemere:—

F. Milton	£1,392	D. Fry	£1,198
R. Smith	1,350	Haslemere Builders, Ltd.*	1,185
Chapman & Lowry	1,300		

MORESBY.—For erecting new stables and byres at High Common Gate Farm, Moresby, near Whitehaven, for Mr. W. Burnyeat. Mr. J. S. Stout, architect, 36, Lowther-street, Whitehaven. Quantities by architect:—

Mason: H. J. Doloughan, Bigrigg, Cumberland	£553 7 1
Joiner: J. Shaw, Moresby	222 18 1
Slating: G. Burrow, Workington	106 19 2
Plumbing: W. Holloway, Whitehaven	18 19 3

SALTASH.—For premises, Fore-street, Saltash, for Mr. F. A. Rawling. Mr. Edgar M. Leest, architect, Devonport and Saltash. Quantities by Messrs. Leest & Adams:—

T. May & Son	£759 0	W. H. Rothery, Saltash‡	£426 0
Pearce Bros.	467 17		
W. V. Alford	436 4		

‡ Revised tender accepted.

SANDBACH.—For erecting workshop, alterations, etc., at the central premises, Bold-street, for Sandbach Industrial Co-operative Society, Ltd. Mr. A. Price, architect, Elworth, Sandbach:—

W. Street	£775 0	G. Edwards, Alsager*	£549 10
J. Stringer	755 11		
Jackson & Co.	595 0		

[Quoted probable cost £561.]

SENGHENYDD.—For erecting sixty houses and for road-making, etc., for the Lewis Merthyr Consolidated Collieries, Ltd. Mr. J. H. Phillips, architect, Clive-chambers, Windsor-place, Cardiff:—

C. Jenkins & Son	£15,902 7 10	I. Evans	£12,850 0 0
Davies & Lloyd	14,812 16 6	R. Jones	12,604 0 0
T. F. Howells	13,510 0 0	A. J. Rossiter	12,600 0 0
A. Richards & Son	13,079 0 0	J. Pugh	12,418 10 3
M. Harding	13,051 0 0	J. Williams	12,062 0 0
W. J. Madley	12,968 0 0	J. Howells	11,796 15 0
		Hamilton & Millard, Caerphilly*	11,639 0 0

SEVENOAKS.—For erecting an isolation hospital at Otford, for the Rural District Council. Mr. M. Maberly Smith, architect, 62, Berners-street, Oxford-street, London, W. Quantities by Messrs. Gleed & Belcher, 8 and 9, Martins-lane, Cannon-street, London, E.C.:—

G. E. Wallis & Sons, Ltd., Broadmead Work, Maidstone	£5,534

STOKE-ON-TRENT.—For erecting a mission church and schoolroom at Beech, for the Rev. D. W. Jenkinson. Messrs. R. Scrivener & Sons, architects, Hanley:—

J. Cooke	£1,440	J. Fielding & Sons	£1,278
I. Ward & Sons	1,416	Tompkinson & Bettelley, Longton*	1,197
T. Godwin	1,347	T. Moss	1,193
W. Whitfield	1,345	T. R. Yoxall	1,180
S. Heath	1,297		

SOUTH SHIELDS.—For the construction of 87 lineal yds. of concrete sea-wall between Whitburn and Fulwell, for the Rural District Council. Mr. J. H. Morton, F.R.I.B.A., 50, King-street, South Shields:—

J. Rule	£509 5 0	R. M. Storey	£376 17 0
G. Wells	440 0 0	D. & J. Banken	375 0 0
Middlemiss Bros.	438 0 0	Kirk & Brown	366 0 0
J. Young	432 4 0	J. W. White	363 0 0
J. L. Miller	427 3 6	J. H. Hall	317 5 3
W. D. Allison	415 8 3	J. Johnson, East Boldon*	315 9 9
R. Purvis	405 0 0	G. Bailey	311 9 7
J. B. Stott	398 17 6		
Clerey & Charlton	390 0 0		

[Surveyor's estimate, £305.]

STAINLAND.—For taking up and redressing about 660 yds. super. of old setts and repaving with new setts, part of Station-road, for Stainland-with-Old-Lindley Urban District Council. Mr. J. H. Walker, Surveyor, Mechanic's Hall, Stainland:—

D. Brook & Son, redressing old setts, 10d. per yd.; setting new setts, 2s. per yd.; setting old redressed setts, 2s. per yd.

W. Billington & J. White, redressing old setts, 9d. per yd.; setting new setts, 1s. 9d. per yd.; setting old redressed setts, 2s. 6d. per yd.

Riley Bros. & Hartley, redressing old setts, 7½d. per yd.; setting new setts, 1s. 6d. per yd.; setting old redressed setts, 1s. 6d. per yd.

Amos, Burton, Lee Mount, redressing old setts, 9d. per yd.; setting new setts, 1s. 2d. per yd.; setting old redressed setts, 1s. 3d. per yd.*

SUNDRIDGE.—For alterations and additions to the Union Workhouse, Ide-hill, for Sevenoaks Guardians. Messrs. Llewellyn & Pawley, architects, 86, High-street, Sevenoaks:—

C. Bentley	£256 0	E. Wallis	£197 0
R. Durtnell & Sons	245 0	K. Canfield, Sundridge, Sevenoaks*	157 10
W. P. Banks	219 0		
H. J. Smith & Son	198 0		

WELLINGTON.—For erecting house and butcher's premises at Trench-road. Mr. A. Jenkins, architect and surveyor, Bell-street-chambers, Wellington:—

France Bros.	£554 0	Skelhorne	£500 0
Blakemore	549 0	W. Martin, Donnington*	496 5
A. Holmes	545 0		

WESTON-SUPER-MARE.—For alterations and additions to the matron's house at Statutory Hospital, for the Urban District Council. Mr. Hugh Nettleton, Surveyor, Town Hall, Weston-super-Mare:—

A. Rossiter & Sons	£356	H. A. Forse & Sons, Contractors, Bristol*	£309
H. Dyer	325		

Correction.—In our issue of the 14th inst., in the list of tenders received for stabling, etc., at Seaford, the address of Messrs. Wm. Cooper & Coussens is given as Eastbourne. It should have been Hastings and Seaford.

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